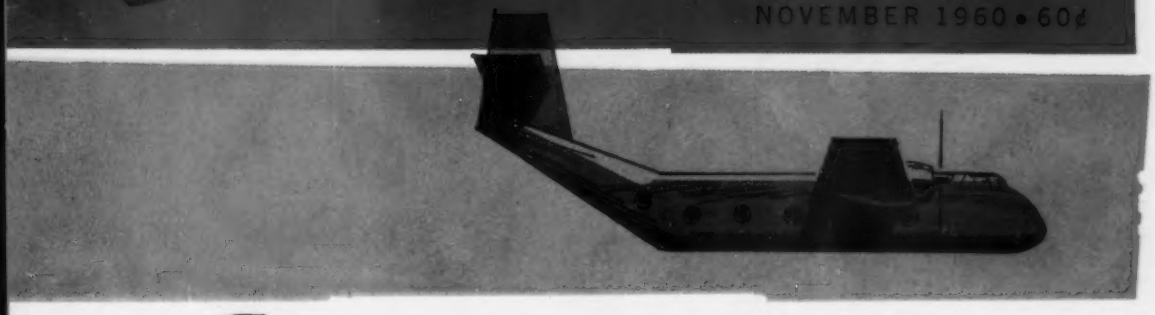
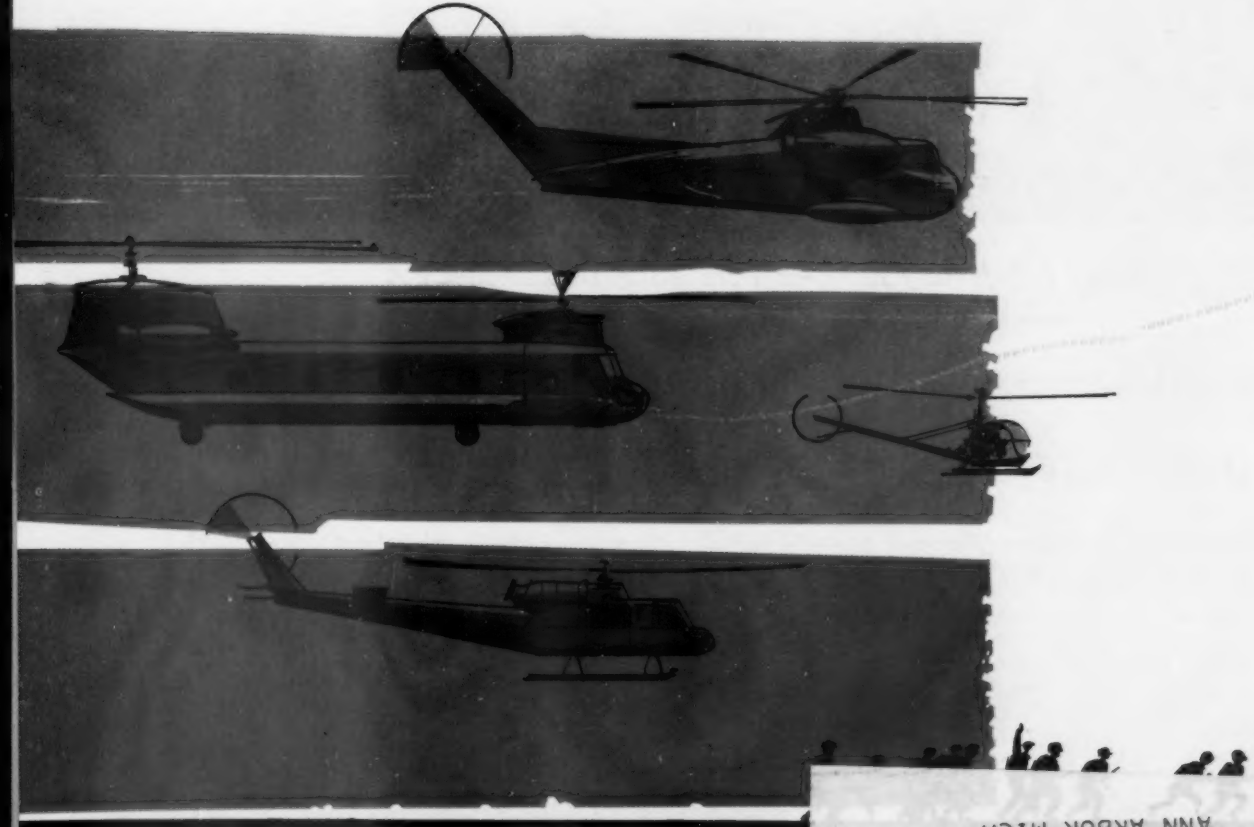
ARMY

NOVEMBER 1960 • 60¢



ARMY AVIATION

A long look at why it is . . . what it can do . . . where it is going



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ARMY

A PROFESSIONAL PUBLICATION DEVOTED TO THE ADVANCEMENT OF THE MILITARY ARTS AND SCIENCES AND REPRESENTING THE INTERESTS OF THE ENTIRE U. S. ARMY

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COVER

Design by Tom Hickson

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SPLIT—SECOND INFORMATION

An effective Army must have split-second, exact combat intelligence. Republic's Missile Systems Division is working on one means of fulfilling this need for the U. S. Army with the AN/USD-4 Swallow system: a completely integrated ground-airborne information-gathering system.

The SD-4 system includes an all-weather, jet-powered surveillance drone, mobile ground command and information stations, and associated ground support equipment. The drone will be field-launched and employs any of a number of surveillance sensors. This high-performance unit will permit the field army commander to extend his view beyond the horizon to gain up-to-the-minute information. Its mission completed, the SD-4 will return, be recovered and readied for a new mission.

The airborne-ground SD-4 Swallow system was designed and is being developed by Republic's Missile Systems Division under contract to the U. S. Army Signal Corps.

REPUBLIC AVIATION

MISSILE SYSTEMS DIVISION

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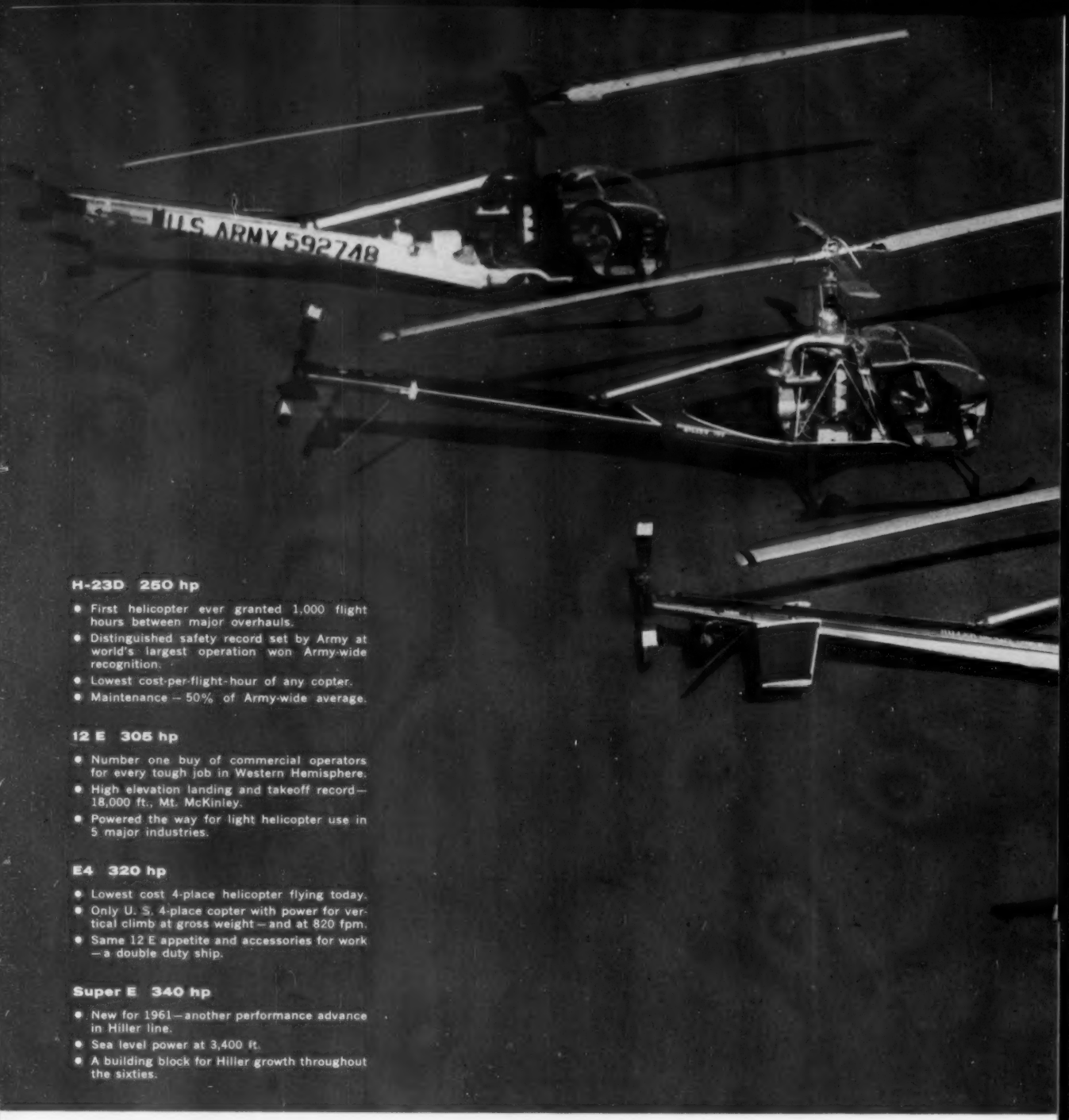

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***The Super E,** fourth in Hiller's current line, is the 1961 entry in this one company horsepower race—and by no means the last entry. Even with the Super E's 340 horsepower to lift sea level performance to 3,400 feet, there's still more to come . . . in the helicopters that are ahead for the sixties!*

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ARMY letters

THANK YOU, SIR!

● Please accept my heartiest congratulations on the September issue of ARMY. This report on the AUSA Annual Meeting is a magnificent effort. It is particularly valuable since it brings to those who could not be present in person the inspiration which this annual meeting provided so outstandingly.

Again, my most sincere congratulations to you and your staff.

WILBER M. BRUCKER
Secretary of the Army
Washington, D. C.

O&I REPORT

● I read with interest the article "Discipline and the Frequent Offender" in the August issue.

The correct number for the Offense and Incident Report is DD Form 578, not 581. The title of DD Form 581 is Complaint Report, with item 13 calling for the telephone number.

MAJ. ROBERT A. O'BRIEN
Fort Geo. G. Meade, Md.

ANNUAL MEETING REPORTS

● I thoroughly enjoyed the September issue of ARMY. In particular, I thought the articles by Generals Speidel and Gavin were outstanding.

CAPT. BLISS W. WILDER
Huntington, West Va.

AGGRESSIVE TRAINING

● Thank you for publishing Captain Gallagher's "Marching Forth to What War?" [July]. A rather negative gratitude, however.

One must agree with General Verbeck's letter [September], and wonder whether or not these officers, who are so devoid of training sense, should be retained on any active status. They are sadly in need of some command supervision—a kick in the pants along the road to better training.

My experience has led me to believe that the older officers—if left alone—will permit their training to deteriorate much farther without complaint, than the younger ones. The younger officers beef, have poor morale, or leave. The older ones have their memories to fall back on, and they do just that.

To keep the young men, an aggressive training program is a must, and they need leadership in the development of such a program.

My main purpose is to compliment you on the occasional article that seems to be intended to wake some of us up, arouse some indignation. This one did.

COL. JOHN B. DE HOFF
Baltimore, Md.

TRAINING IS YOUR RESPONSIBILITY

● After reading the letters to the Editor in the September issue, I must admit that there is a certain dullness in some drill meetings. However, I might suggest that there are extension courses for every branch of the service. If one takes up the study of a new branch, he may increase his knowledge in an infinite ratio. After 16 years of Signal I tried Artillery, and it has been well worth the effort.

Secondly, to the gripers: it seems to me that the responsibility of any officer is to be sure *he* is trained and capable. The responsibility does not lie with anyone else.

CAPT. J. A. K. RICHARDS
Van Nuys, Calif.

FOR MARKET-GARDEN VETERANS

● I am doing the research for a book dealing with the invasion of Holland from 17 September 1944. I should like to get in contact with persons who took part in that operation until relieved by Canadian troops. My address is 686 Buttonwood Street, Long Branch, N. J.

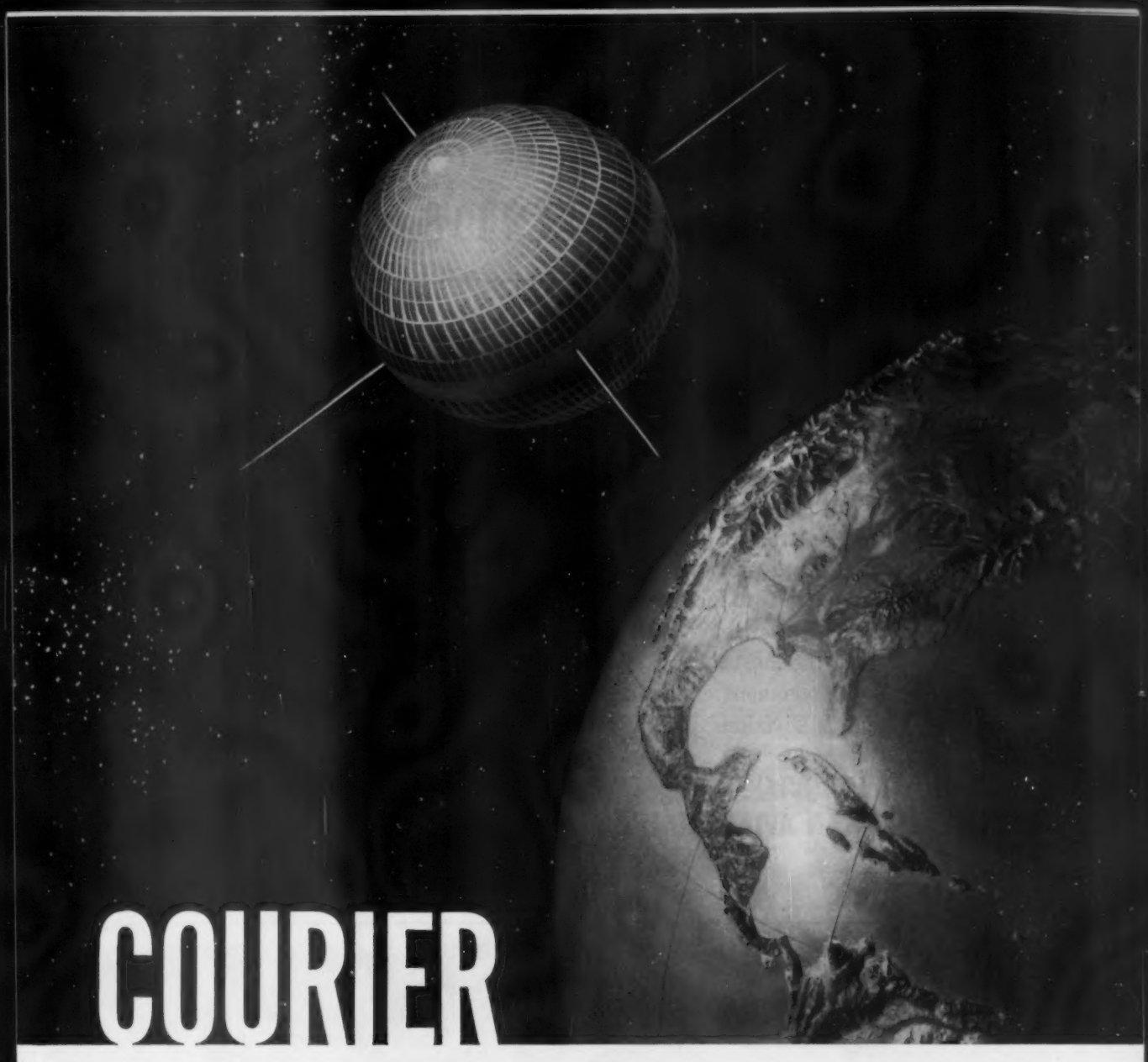
CLARENCE F. MONTGOMERY

THE LONG-SUFFERING PUBLIC

● In the October issue of ARMY, Colonel William R. Kintner has suggested that perhaps the major reason why U. S. atomic weapons were not used in Korea was the attitude of the European and American publics. I am not aware that American office holders are usually responsive to European public opinion, and so I will confine myself to his reflections on the U. S. public.

On occasion, American failures in

(Continued on page 9)



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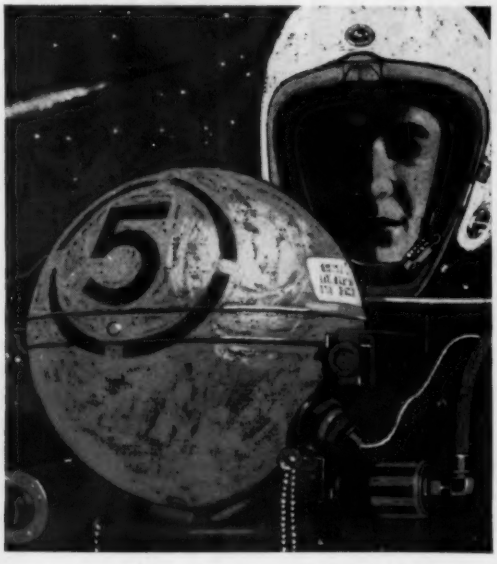

RESEARCH AND DEVELOPMENT. Cryogenics research at Columbus led to the development of liquid oxygen systems for aircraft. Now one cubic-foot of LOX can replace 862 cubic feet of gaseous oxygen.

at NAA-Columbus

NEW TARGET MISSILE. Two missiles in one, this unique target missile can carry out either high or low level missions equally well. It performs from subsonic through Mach 2 speeds, and from ground level to 60,000 feet. Under development for the Army by the Columbus Division, it is rocket launched, ramjet powered.

THE BIG "EAR." The world's largest radio telescope reflector, 600 feet in diameter and more than seven acres in area, is being built by the Columbus Division for the U.S. Naval Radio Research Station in Sugar Grove, West Virginia. The 10-foot thick movable reflector will have a potential range of billions of light years.

(Continued from page 6)

the largest issues of statecraft have been charged to the American public, as one eminent politician did with Pearl Harbor. Gentlemen in public life, or on the fringes of public life, seem not to realize that it is singularly ungraceful of them to blame the public for their failures. One would think that a willingness to assume responsibility when things go wrong would be among the qualities of a public man, but too few are willing to do so. However, I have yet to hear of anyone's refusing a medal, a promotion, or an honorary degree on the grounds that the success was really that of the American public. Colonel Kintner, I am afraid, belongs to a school which believes that success is the proof of personal merit while failure is, somehow, the fault of the American public.

Poor, old, long-suffering American public! It has never yet refused to give its sons and its taxes to defend the good cause, it has never shrunk from sacrifice, but this is not enough. Colonel Kintner thinks he can blame it for a failure to use atomic weapons in Korea. The men who held high office and high rank are blameless and are in the happy position of having held rank without responsibility.

There is only one group which can ever and with propriety blame the American public. It is those who offered good advice only to have it rejected. If during 1950-53 Colonel Kintner publicly urged the use of atomic weapons in Korea, then let him quote from his records, or let him, in default of that, quote others who so recommended. Meanwhile, let us have no more suggestions that American office holders can shelter themselves behind the public by whom they were given power to govern.

Indeed, one might rather observe that twice the productive capacity of U. S. industry, the valor and hardihood of the U. S. soldier, and the sacrifices of the U. S. public have brought victory in a world struggle only to have that victory cast away by the short-sighted follies of the U. S. elite. RILEY SUNDERLAND

Washington, D. C.

● *Your editors agree with Mr. Sunderland, a former Army historian, that the public is often blamed for shortcomings that are the failure of leadership. But we think he is unfair, unknowingly perhaps, in blaming Colonel Kintner for not speaking out publicly. Colonel Kintner, during the Korean war and now is an Army officer on active duty and hardly in a position to speak out. If we did not make this clear we should have.*

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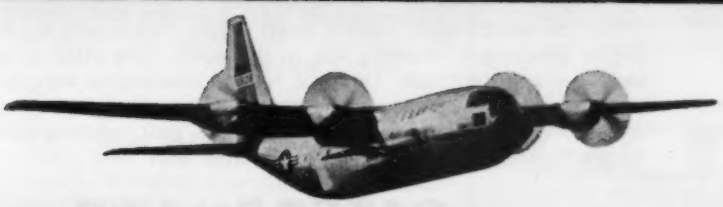
Lockheed Georgia Division, Marietta, Georgia.



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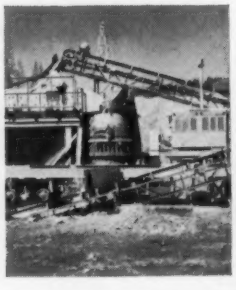

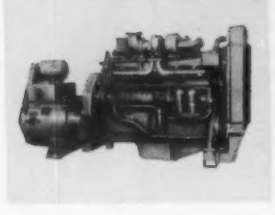

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Engine Division, Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

ARMY authors

Col. FRANCIS S. DRATH, Infantry, (page 30) is currently Deputy State Director, Nebraska Selective Service. A member of the Nebraska Army National Guard, during World War II he was on the staff of the 80th Infantry Division and with Military Government in Germany. Colonel Drath has written for the *Infantry Journal* and *Coast Artillery Journal*.

Brig. Gen. CLIFTON F. VON KANN (page 40), who is rated in helicopter, fixed-wing, twin-engine and instruments, has been Director of Army Aviation since July 1959. He was commissioned in the Artillery in 1938 after a competitive tour under the Thomason Act. During World War II he commanded Field Artillery battalions in North Africa, Sicily and Italy. In the Far East he was executive and CO of 7th Division Artillery, G3 Advisor to ROK First Army, and served on the staffs of Army Forces, Far East, and Eighth Army. Before becoming Director of Army Aviation General von Kann served a hitch with the 82d Airborne Division when he qualified as senior parachutist.

Maj. Gen. DWIGHT E. BEACH (page 49) commands the 82d Airborne Division at Fort Bragg, N. C. A 1932 graduate of USMA, during World War II he served in the Pacific where he commanded the 167th FA Battalion (41st Infantry Division) and was executive officer, 24th Division Artillery. While on these assignments he earned the Air Medal with Oak Leaf Cluster.

Lt. Col. JOHN W. OSWALT, Artillery, (page 54) has been associated with Army Aviation since 1942. He is a Master Army Aviator, qualified in both fixed- and rotary-wing, and is instrument rated with more than 4,300 hours. During World War II he was with the 1st Armored Division in North Africa and Italy, and became personal pilot for General Mark W. Clark. He has held varied aviation slots with U.S. Forces in Austria, at Sixth Army, Wright-Patterson AF Base, CONARC, and was Army Aviation Officer of Eighth Army and of the Far East Forces.

Capt. RICHARD L. KIRK, Artillery, (page 64) was commissioned in 1946 as a Japanese linguist. After attending college he won a competitive tour with the 2d Armored Division and the 3d Infantry Division. In Korea he was a forward observer with the 58th Armored Field Artillery Battalion and commanded a battery of the 9th Infantry Division in Germany. Captain Kirk is an ROTC instructor at the University of Washington, during which tour he was an evaluator for the Atomic Flash Warning System test conducted in Exercise Dry Hills.

CHARLES S. STEVENSON (page 60), an occasional contributor, journeyed to the Far East for ARMY early last summer. He is civilian aide to the Secretary of the Army from Western Missouri.

Major JOHN M. COLLINS, Infantry, (page 68) has been G-2 Plans Officer, XVIII Airborne Corps, and Assistant G2, 82d Airborne Division. He was co-author of "No Job for Amateurs" in our April 1960 number and wrote "Deep Penetration Parachute Patrols" in the December 1959 issue. Major Collins commands Signal Research Unit No. 7 in Greenland.

Master Sgt. HANS R. HAUKE (page 72) has served in the Philippines, Japan, Panama, and is presently in Korea with USAPI. He began as a medic in 1943, was commissioned in January 1945 and reverted to enlisted status in 1948. Since 1950 he has served in the Transportation Corps except for a lapse of 18 months in the Medical Corps.

Master Sgt. FORREST K. KLEINMAN (page 72) has written many articles for ARMY, beginning with "We're Getting Tougher" (October 1950) when he was a major in Korea. During World War II he was with the 3d Infantry Division.

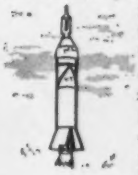
(Continued on page 15)

STRUCTURAL INTEGRITY OF SOLID PROPELLANT GRAINS

The demand for ever larger rocket motors, coupled with the importance of mobility, fast countdown and low cost, steadily increases the importance of solid propellant rockets. To extend the state-of-the-art, Grand Central Rocket Co. has accelerated an important research project on the amount and cause of physical deformation or propellant "slump" in very large solid propellant motors.

Because the solid propellant is essentially a rubbery, visco-elastic material, it may be deformed—like rubber—by a combination of force and time. Its behavior is strongly dependent on the conditions of deformation and is particularly "rate" sensitive. Under extreme conditions this deformation can cause failures.

The studies by Grand Central Rocket's research team will attempt to establish criteria for the amount of deformation of various solid propellant materials under various combinations of time and force, such as during ignition (short time, large force); in flight (less force, longer time); or during storage (thermal cycling and gravity forces, for a long time).



From the research being conducted, engineers will be able to design large solid propellant motors which have known values of structural integrity—and resultant operational reliability.

Grand Central Rocket scientists and engineers are developing design criteria based on non-linear visco-elastic theory—a basic step necessary before very large missile motors may be designed with high certainty of reliability.

The project is another demonstration of Grand Central Rocket's unique capability to handle difficult assignments in the field of rocket motor and propellant research—a capability assured by one of the nation's finest rocket research and design teams.

Positions open for chemists, engineers and solid rocket production specialists.

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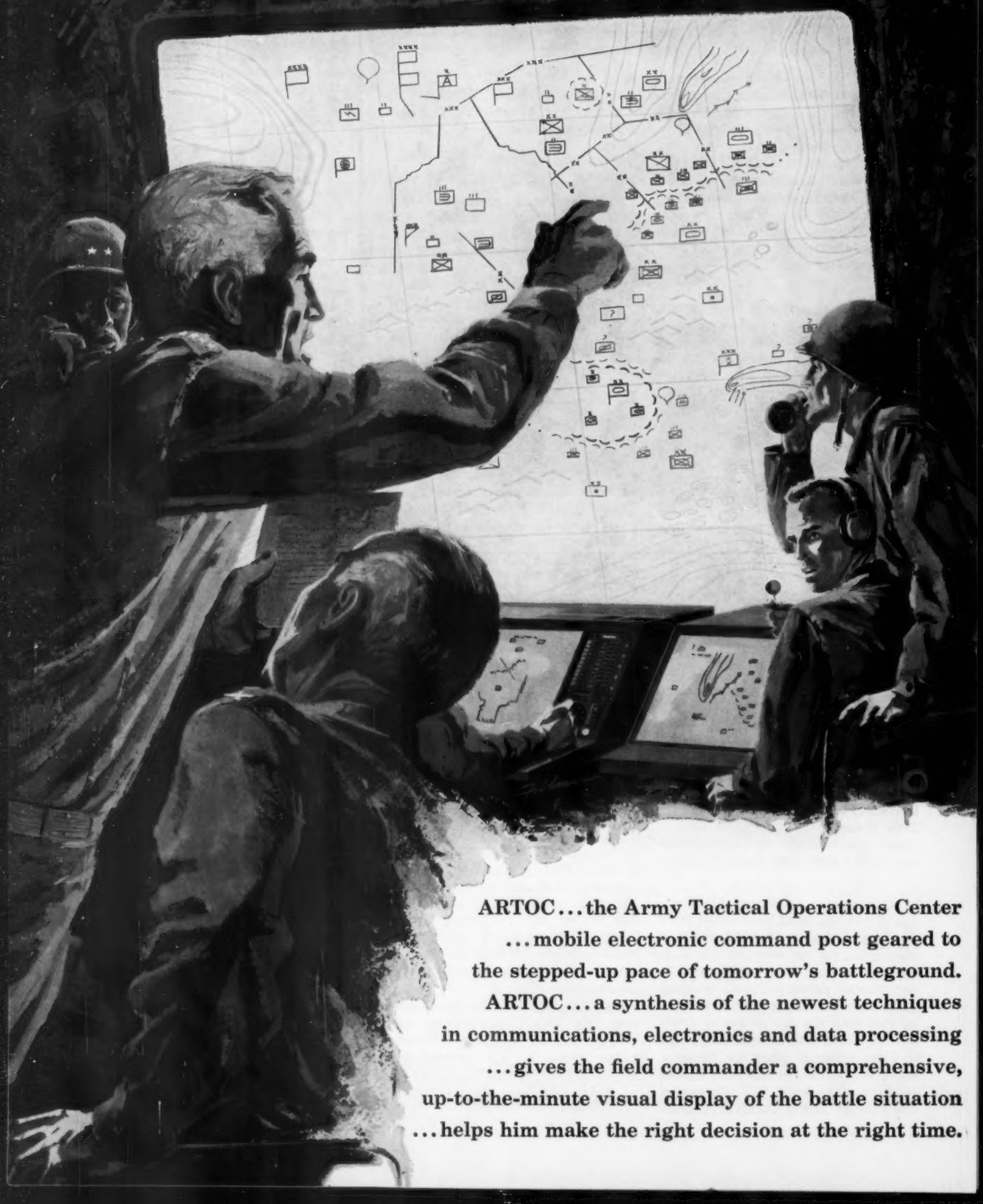

ARTOC... the Army Tactical Operations Center ... mobile electronic command post geared to the stepped-up pace of tomorrow's battleground. ARTOC... a synthesis of the newest techniques in communications, electronics and data processing ... gives the field commander a comprehensive, up-to-the-minute visual display of the battle situation ... helps him make the right decision at the right time.

(Continued from page 13)

Since leaving CONARC early this year Sergeant Kleinman has been at Sixth Army headquarters.

Col. WILLIAM FOLEY (page 74), Chemical Corps, is assigned to OJCS, having recently completed a tour as Chemical Officer, Sixth Army. He was commissioned in the Reserve in 1937, has been on continuous active duty since 1940, and was integrated into the Regular Army in 1947.

Lt. Col. JOHN C. VALLOR, Artillery, (page 74) has been on active duty since 1941. During World War II he served in ETO with the 227th FA Battalion (29th Infantry Division), and in Korea at I Corps Artillery headquarters. Since 1957 he has been on the faculty of the Artillery and Missile School, where since February 1960 he has been Chief of the Extension Courses Division.

Col. CHARLES W. GIBBS, Signal Corps, (page 76) is a frequent contributor to ARMY. His background is largely in the field of tactical communications. Colonel Gibbs has served in several capacities at the Signal Research and Development Laboratory and was Signal Officer of the Air Defense Center. He is now with Eighth Army in Korea.

Capt. FRANK P. VELLELLA, Signal Corps, (page 78) has served at Fort Monmouth, Fort Devens, and in Korea and Japan. A 1951 graduate of USMA, he has attended the Signal School, the Intelligence School, and the Army Security Agency School, and is now at USAREUR Headquarters in Germany.

Coming Next Month in

ARMY

LINE AND STAFF
Lt. Gen Henry S. Aurand, USA, rtd.

DELUGE OR DROUTH
Col. Robert B. Rigg

THE BRITISH SCHOOL OF INFANTRY
Lt. Col. Lawson W. Magruder

THE MAXMAR DIVISION
Col. Allen C. Miller III

ARTOC... is being developed by Aeronutronic Division of Ford Motor Company for the U.S. Army Signal Corps. It is one of many Aeronutronic programs aimed at simplifying military and industrial problems through the use of an advanced computer and data processing technology. These programs—and many others related to advanced weapon and space systems—are underway at Aeronutronic's Engineering and Research Center, in Newport Beach, California. They demonstrate Ford Motor Company's rapidly-growing capability in meeting the needs of science and defense in the changing world.

A booklet describing Aeronutronic's accomplishments and capabilities is available to you on request.

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for the modern mobile army

ATTACK: Intelligence is also a prerequisite of mobility. The foot soldier will soon fight a three-dimensional war. Development is headed toward flying belts, air-cushion craft, high speed VTOL transports, and logistic missiles. Integrating and processing information for this high speed army is another of our fields. Our studies are directed toward the improvement and integration of communications, transportation, logistic support, tactical plotting, command integration, electronic assault aids, countermeasures ...the Army's total requirements. This means ultimate miniaturization, reduction of power drain, and environmental reliability. It implies research in techniques for advancing the science of mobility. From implication to application, we are involved in the electronics needs of the modern mobile army.

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ARMY editorials

Towards Air Mobility

Paradoxically, the greatest promise in achieving really significant improvement in ground mobility lies in air mobility. The battlefield of tomorrow is likely to present more obstacles to movement than anything previously experienced. We must be able to hurdle these obstacles without interrupting our movement. Specifically, we need air vehicles directly under the ground commander's control for a number of purposes. We need them to move combat soldiers, their weapons, supplies, and wounded more speedily and easily about the battlefield; we need them for reconnaissance and observation—to locate the enemy and direct the fire of Army weapons; we need them to provide essential communications and liaison between dispersed ground units, and to permit the commander to fly speedily to critical areas during combat and exercise on-the-spot leadership. They can also be used to place equipment and weapons in positions unattainable by ground transport. Rivers, mountains, swamps, forests, minefields, or areas contaminated by radiation or chemicals can be traversed in minutes instead of hours or days.

These air vehicles must be rugged, dependable, and capable of living in the battlefield environment in which the soldier operates. Such air vehicles would be ready to move, day or night, in any kind of weather.

Unlike Air Force and Navy planes which depend on speed and altitude for protection, the Army needs air vehicles which can fly low and slow. Many of these Army aircraft would hug the ground, using forests, hills, valleys, and other terrain features for cover and concealment—as the soldier has always done.

* * *

Meanwhile, I would like to state that the Army has no intention of duplicating, with its aircraft, those functions—such as close support and deep reconnaissance—performed by the Air Force. Nor do we intend creating another "Air Corps" within the Army. On the contrary, our Army aviators and aircraft are not organized in a separate Corps but are distributed throughout the entire structure of our Army organization.

GEN. GEORGE H. DECKER
Chief of Staff, U. S. Army
3 October 1960

Army Aviation Needs Freedom

As a ballplayer just about everything is wrong with Yogi Berra except his performance. So, too, with Army Aviation. It is this, we have concluded after prayerful contemplation, that causes critics of Army Aviation to call it "second rate." It's true that the conformation of even the latest turbine-powered helicopter lacks the flowing grace of an F-4H Phantom II and that the Mohawk observation aircraft looks more like Yogi than Mickey Mantle. But this is to confuse form and substance; Berra's sturdy daily performance with Mantle's flashy potential. It is to put a preconceived notion ahead of demonstrated ability to perform an allotted task. These critics may be confusing themselves by considering Army Aviation as a part of what they call airpower instead of looking at it for what it is: an extension of the ground power of armies by using the air space immediately above the battlefield.

The case for Army Aviation is strong. Had it been studied and accepted by the then responsible arm of the Army in the early post-World War II years, aviation to support the Army's ground fighting forces would be much farther advanced now. Instead it was opposed. Programs to obtain more efficient and effective air vehicles for the Army have been blocked by stubborn resisters who threw up arbitrary restrictions and other impediments. They simply didn't "believe" in it.

Evidence?

Item: During the middle 1940s a division commander in this country managed to get a couple of helicopters which he used in tactical experiments with small units. The commander of a neighboring airbase protested. In the first place, the ground army had no right to be flying those things, he said; and in the second, they were outlandish contraptions, a waste of money, and the military would never buy another one if he could stop it.

Item: The late Larry Bell once related his difficulties in selling a few helicopters to the ground Army which wanted them and had the money, but ran into difficulties with the air side. The opposition was finally overcome and those "outlandish contraptions" were the H-13s that did yeoman service in Korea and saved the lives of many American fighting men.

Item: The restrictions imposed by the Department of Defense on the weight of Army aircraft. It is surely significant that one can be told in Washington today that responsible officials are willing to lift this restriction, but haven't done so because they don't want to disturb sleeping dogs.

On this last item further comment is necessary. It is said that the restriction has no real meaning since exceptions have been and will be made in *(Continued on page 81)*

WESTINGHOUSE CAPABILITIES FOR DEFENSE

Westinghouse Electric Corporation continues to make significant advances in computer science with the versatile new WDP-167 airborne digital computer. This computer performs 167,000 mathematical operations per second. Each operation includes two memory cycle times plus arithmetic execution time.

The surprisingly small WDP-400 computer, now in development, will perform 400,000 operations per second.

Both are general purpose computers for advanced applications in such fields as radar detection, defensive systems, space guidance, satellite tracking, missile and fire control.

Backed by years of experience in the military computer field, these developments at Air Arm Division are another important factor in Westinghouse *capabilities for defense. You can be sure . . . if it's Westinghouse.*

J-02323

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ROTC: The Officer Reservoir

Brig. Gen. M. W. SCHEWE
Deputy Assistant Chief of Staff
for Reserve Components, Department of the Army

"Is the ROTC adequate to the task?"

"Does the military profession suffer from the concept of the citizen soldier?"

"Should colleges be a source of career officers instead of massive numbers of reserves?"

In its October issue ARMY asked its readers all these questions, and more, in a provocative article, "The Campus: Recruiting Ground for Professional Military Officers."

"Yes," "No," and "Both," are the obvious first three replies. Disturbing? No, not so much in the fact that they were asked, as in the inference that some Americans might not have scored 100 per cent on their answers. Apparently, to some, the purpose and motive of the Army ROTC program is not thoroughly enough understood and needs to be clearly explained.

The Honorable Wilber M. Brucker, Secretary of the Army, recently brought the entire ROTC picture into proper focus when he stated: "The Army doesn't exist for the purpose of insulating people from trouble. The Army is representative of the American people themselves. The ROTC gives not only training for military, but gives young men the discipline so necessary and furnishes broad patriotic motivation that will permeate through the whole cross section of American life."

When this nation is faced with a national emergency, it depends upon the "citizen-soldier" to insure an adequate military posture. The value of these citizen-soldiers is recognized by no less an authority than the late General George C. Marshall, who said that during World War II, the pool of 140,000 Reserve officers, the vast majority of them being produced by the ROTC, made the difference between defeat and victory. And the ROTC is still performing the very vital mission of providing junior officers for our active and reserve forces.

If depth in the military structure of the Nation is to be insured in today's uneasy international atmosphere, it is positively necessary to maintain a constantly replenished reservoir of Reserve officers having educational and training backgrounds similar to those possessed by officers of the Regular Army.

Through the colleges and universities flows a continuous stream of America's prospective young officer material. The sound academic foundation of a college education is essential to the development of the dynamic leadership of present and future Army officers. For this reason, colleges and universities must continue to play an important role in behalf of national defense.

To telescope the barest rudiments of today's essential military subjects into the already crowded curriculum of today's colleges and universities is no small feat. It is not enough that a potential officer have a grasp of the fundamentals of his trade. In an atomic age, he must also be prepared to cope with warfare involving nuclear physics, international politics and strategy, a national economic policy—requirements which are well beyond the demands placed upon his predecessors. In spite of these increased demands for technical knowledge, the education given fledgling officers still must insure their possessing those traits and techniques that will enable them to lead men successfully in battle.

The ROTC curricula are the result of an evolutionary process. Changes occur from day to day and from year to year. Following almost two years of study and research by the Army Staff, the Secretary of the Army on 12 February 1960 approved a revised curriculum for the Senior ROTC, responsive to the requirements of a modern education, the pressure of time on the student, and the need for equitable academic credit. The revised curriculum authorizes the substitution of 45 hours per year of university-taught subjects in the junior and senior years of the course. The subjects making up these 90 hours of academics may be selected by the student in the areas of science comprehension, effective speaking and writing, general psychology, and political institutions. Credit in these areas is granted students by the Army and the educational institutions. By such an evolutionary process, far from "patching" up the ROTC structure, the Army is keeping abreast of modern educational requirements.

This nation's security and the preservation of its democratic ideals depend upon every young man's accepting the responsibilities of active and vigorous citizenship. In a democratic society, this requires every citizen's contribution—according to his capacity—his leadership, talents, and service whenever the national security is threatened. "Education for citizenship" is the avowed objective of American educators, and the thorough preparation of our young men for accepting the responsibilities of citizenship should be one of the most important goals of U. S. schools and colleges.

In further development of the thought on the ROTC picture so well expressed by Secretary Brucker, the Army places the highest reliance in and emphasis on its Reserve components. This traditional dependence and emphasis on the Reserve forces has led the Army to recognize that its Reserves on the one hand plus active forces on the other together constitute "One

(Continued on page 81)

ONE PULL OF THE DIAL AT HQ

rings up to 480 telephones *simultaneously* with a group-alert message!

Something long needed in military communications has now been provided by Bell System research.

It's the new *Group Alert and Dispatching System*, and it works like this:

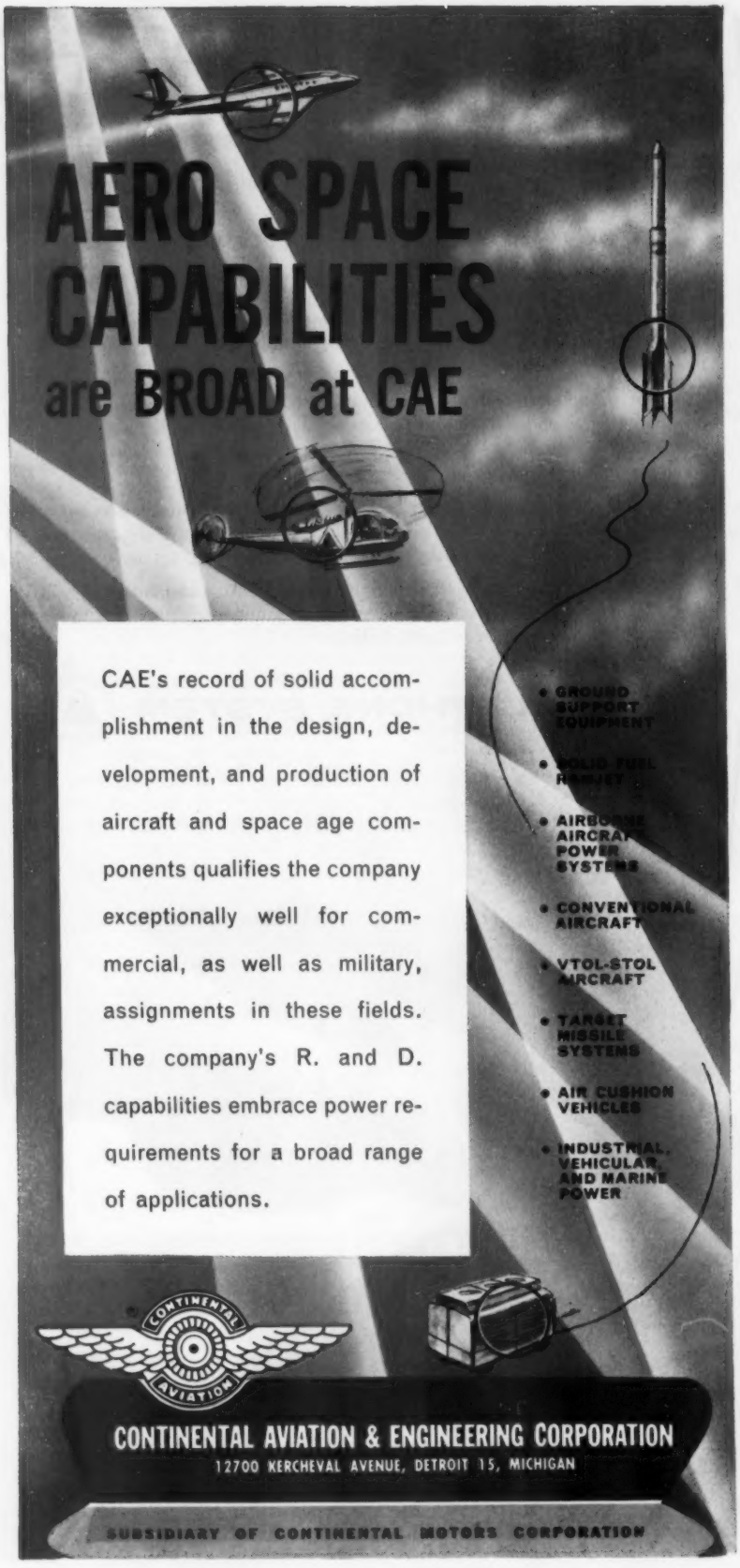
An authorized person dials a single-digit code on a special telephone. Immediately, at all associated home or office telephones (up to 480 of them) a distinctive, staccato ring is heard. This ring continues for several minutes or until the phone is answered. If the line is busy, the system waits until the line is free, then rings.

The group-alert call does not interfere with regular service on the associated telephones. An optional feature lets a dispatcher dictate an alert message which can be instantly recorded and automatically broadcast, over and over again, to all telephones in the system.

This new development is now being tested for military and non-military defense applications. It will also be useful to volunteer fire departments, power companies and for Civil Defense warning.

The Group Alert and Dispatching System is an outstanding recent example of progress in the Bell System's continuing program to improve both military and civilian communications.

BELL TELEPHONE SYSTEM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ARMY — front and center

The 'Lift' Gap

Two days after he was sworn in as Chief of Staff, General George H. Decker stated the Army's case for mobility—especially air mobility—before the annual convention of the National Defense Transportation Association.

One phase he did not touch upon was the "lift gap": the necessary aircraft to take Army units from the place where the Air Force strategic airlift puts them down to the place where the battle is to take place, and where Army-flown aircraft are used. This requirement (one which General Nathan F. Twining, retired Chairman of the Joint Chiefs of Staff believes to be the Army's most significant need) cannot be met without the removal of the aircraft weight limitation placed upon the Army by Secretary Wilson's decree of November, 1956. This was also the subject of AUSA objective No. 4 for 1961.

A classic example of the "lift gap" would be in the Middle East if trouble were to break out in land-enclosed Iraq. The Air Force could put the Army and its supplies down at Adana air base in Turkey, as it did in the Lebanon crisis.

But how to get to Iraq? The inadequate road nets of that barren land would prohibit moving inland by truck—if enough trucks could be lifted by the limited Air Force lift. It is doubtful that airlift could provide enough tanks, personnel carriers, and gas and oil carriers to support the operation.

What is needed in such a situation is an airplane with a heavy-load cargo capacity that can take off and land on short improvised fields, to shuttle back and forth from the battle area to the strategic air base. Further, this airplane must be capable of loadup with fuel, and by "island-hopping", be flown to the battle areas—a plane with a range (loaded only with fuel) of 1,500 miles per leg. When it reached the zone of operations it could take up its mission of

With its tremendous thrust, *Zeus* can intercept attacking missiles far from the area it defends

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The newest member of the famous Douglas *Nike* family, *Zeus* was developed in a joint Western Electric, Bell Telephone, Douglas Aircraft project. Its design combines the most successful lessons learned from *Ajax* and *Hercules*—*Nike Zeus* predecessors that are on duty around many important U. S. cities and industrial centers and with NATO forces overseas.

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shuttling heavy loads and many men short distances of 200-300 miles.

These "lift gap" craft must be designed for the job. They must be speedy and they will certainly weigh more than 10,000 pounds, and will probably be powered by jet, or turbo-prop engines. Army planners believe that the huge helicopter is not the answer, that either fixed-wing or "mixed wing" planes are required.

In General Decker's talk he stated that the "Army has no intention of duplicating, with its aircraft, those functions—such as close support and deep reconnaissance—performed by the Air Force." Nor has the Army any intent of providing its own strategic airlift, if it can be furnished by the Air Force. The Congress voted more than 300 million dollars for airlift modernization, and the Defense Department and the Air Force are moving to spend it.

Closely related to this is the problem of close air support, the business of Tac Air. There are more than rumors that Tactical Air Command is busily searching for its own role in the missile era, and would like to gain control of medium missiles (200 to 1200 miles). At the moment, Pershing with a range of almost 400 miles, is the one exception granted the Army by the Department of Defense and this missile itself is being eyed by some TAC planners as a possible future weapon of the Air Force, just as the 1,500-mile Jupiter was transferred from the Army.

The larger significance of this is based on two situations, one technical the other semi-political. The first is that the Pershing missile can be extrapolated rather easily to ranges up to 1,200 miles, and the second is that NATO is "demanding" medium range ballistic missiles for its own NATO atomic weapons force.

All this interests the Tactical Air Command and this interest is disquieting to TAC's rated pilots. It is also equally disquieting to Army missile men, many of whom still smart over the loss of the Jupiter and the weight and range restrictions that are indeed artificial and inhibit the Army in its performance of its missions.

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Flight Pay Fiasco

On 19 July 1960, the Assistant Secretary of Defense, Charles C. Finucane held a conference attended by assistant secretaries of all three services to review the Congressional-imposed ceiling on the number of rated (flight-pay status) officers in the services. At this meeting Mr. Finucane stated that since the Air Force had a substantial surplus of rated personnel the Army and Navy should not be affected by the ceiling.

His reasoning was based on the Air Force's own figures which showed that in Fiscal Year 1961 it would have some 2,125 more rated officers than it needed and that this figure would rise to 4,465 in FY 1962, and 7,815 in FY 1963. These figures indicated that USAF could easily absorb the entire reduction, especially so since rated officers of more than 20 years of service are exempt from the ceiling and the Air Force has more than 2,000 of these (the Army has none).

However, on 21 September 1960 Mr. Finucane reversed himself and imposed cuts on all services with little regard either to the excess number of rated officers in the Air Force or the growing requirement for rated officers in the Army.

Based on hard requirements, approved by Defense, and including new aircraft coming into the Army, a minimum of 6,980 Army aviators are needed in FY '61. However, the 5.3 per cent cut imposed by Mr. Finucane on 21 September (the USAF cut is 3.7 per cent) will reduce the number of Army aviators to 6,438.

What this does to the Army is circumscribe its advance towards modernization. It reduces its drive for increased combat mobility. In Europe, Okinawa, Alaska and in STRAC, Army units will be less mobile than they should be because of this action. At the same time the Army's sister service will continue to carry a large surplus of rated officers.

Super-Secretary Up Top?

There's talk of a new "super-Secretary" appointed to bring the overall co-ordination of Defense policy in closer relationship to Foreign Policy. There's specula-

"A quiet, grave man, ***busied in charts,*** *exact in sums,"* said Walter Bagehot, *"the great soldier of today is not a romantic animal, dashing at forlorn hopes."* This being so, the United States Army Map Service commissioned *tech/ops* to undertake Project Topo, a study of data handling techniques which may be used for gathering and processing data from which maps will be compiled in the 1965-1975 period.

A long-range planning program, Topo is expected to lead to faster, more accurate, map-making from aerial photograph data, mapping trains complete with digital computers and fast printing to make 6,000,000 maps a month for an Army in the field . . . in short, a mobile semi-automatic data processing system for military map-making to improve vastly the future Army's capabilities for national defense.

Another example of *tech/ops* pioneering in research and development for business, industry and government.

Appointments are available in systems analysis, operations research and computer technology at all Company locations. Positions are available in the physical sciences at Burlington.

Technical Operations, Incorporated

Central Research Laboratories
Burlington, Massachusetts

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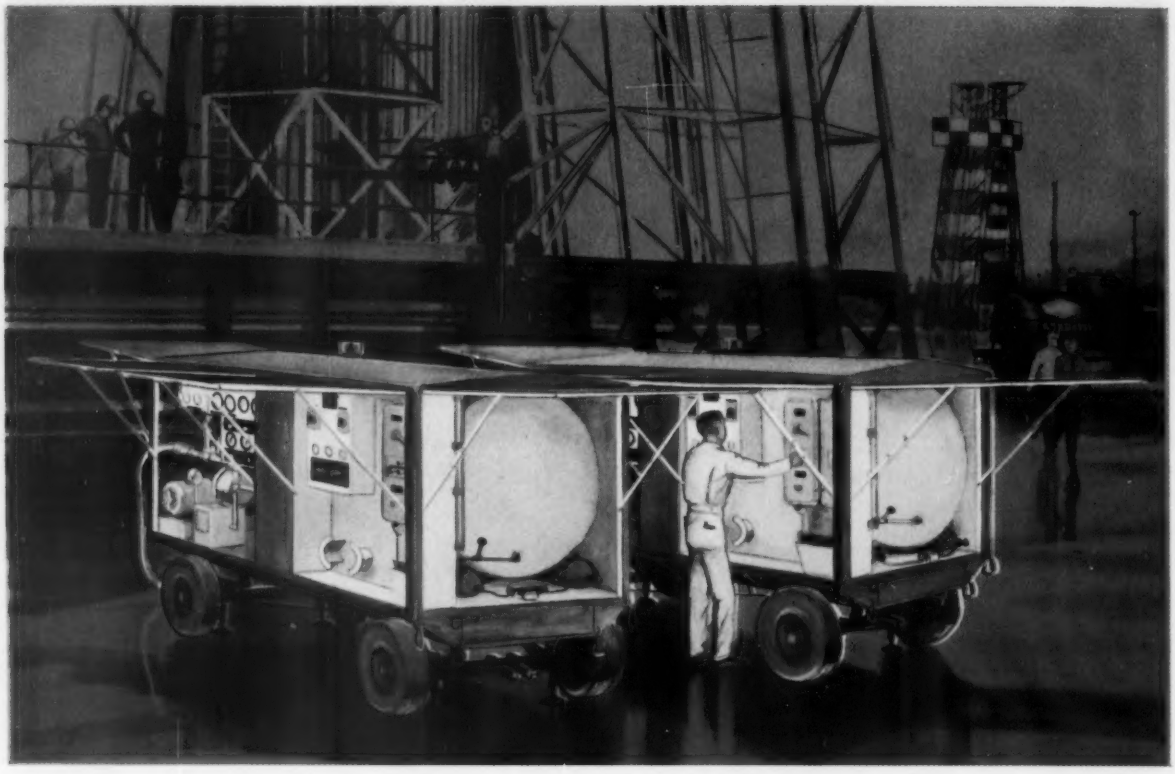

HOW FMC's CHEMICAL AND MECHANICAL EXPERIENCE SOLVES MISSILE PROPELLANT PROBLEMS

Food Machinery and Chemical Corporation, through its integrated divisional operation, offers a unique capability for the design and production of missile propellant handling equipment.

FMC's chemical background covers years of research, development and production of toxic fuels, including high-strength hydrogen peroxide and Dimazine® (UDMH). Utilizing this extensive experience, FMC's Ordnance Division has developed many new processes, systems, and equipment for use in solving critical problems in the handling of missile propellants; among them high-accuracy metering equipment, and the Bomarc decontamination system.

For more detailed information on these studies and for experienced counsel on missile fueling problems, contact FMC, a leading developer and producer of chemical propellant compounds and the equipment to handle them.

For further information, write on company letterhead to Preliminary Design Engineering Dept., FMC Ordnance Division, P.O. Box 367, San Jose, Calif. Phone CYpress 4-8124.

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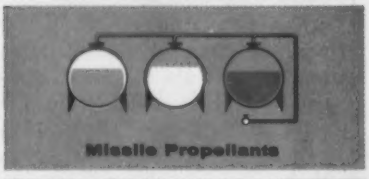
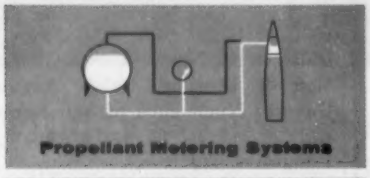
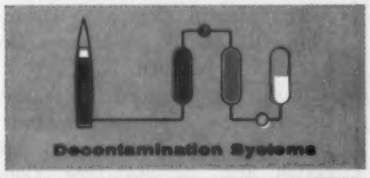
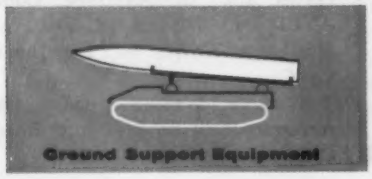
Illustrated below are some of the activities of FMC concerned with missile propellants and propellant handling equipment, which help define a few of the problems successfully solved by utilizing the combination of chemical and mechanical engineering talent available.









FMC's New Liquid Propellant Metering System Achieves Accuracy to ±0.1%

Mobile metering and control unit for fueling liquid propellant missiles.

The crucial reliability of multistage missiles is influenced by the accurate measurement and delivery of liquid propellant to the missile tanks. For example . . . a small error in fuel weight could adversely affect the in-flight performance of the missile, causing possible failure of the entire mission.

Food Machinery and Chemical Corporation's Ordnance Division has recently developed a mobile liquid propellant metering and handling system which promises to solve many missile fueling problems. The advantages offered by this unique new system are many.

Accurately measures and records the amount of fuel delivered to the missile tanks. Original specifications called for a metering accuracy of ±0.2%. Extensive tests, recorded by precision test equipment, show that the system is capable of metering and delivering missile propellants with far superior accuracy—to ±0.1%.

Automatically compensates for factors influencing fueling accuracy. The fuel is continuously sampled and the flow corrected for variations in temperature and density. In addition, the fuel which vaporizes in the missile tanks is returned to the system, condensed, measured, and an equivalent amount added by the metering unit.

Adaptable to many different missile fuels. The system is designed to handle such storable liquid propellants as hydrazine, nitrogen tetroxide, Dimazine® (UDMH) and nitric acid.

Economical to manufacture and safe to operate. To reduce development, manufacturing and operating costs, the system makes maximum use of standard, interchangeable, and commercially available components. The simple and safe design eliminates human errors and danger to operating personnel.

Mobile and compact. All metering, pumping and control equipment is mounted on a single, portable trailer. The complete unit may be easily transported, rapidly positioned, and provides a single station for the monitoring of fueling operations.

The successful development of this mobile metering and handling system by the engineering staff of FMC's Ordnance Division is another achievement made possible by utilizing the unique combination of chemical and mechanical engineering talent available at Food Machinery and Chemical Corporation.

Engineers: a message from...

A UNIQUE ORGANIZATION ENTIRELY DEVOTED TO

SYSTEMS ENGINEERING *and* SYSTEMS MANAGEMENT

Revolutionary changes in the modern army—a new order of mobility and dispersion, and increasingly complex tactical and support requirements—have created critical needs for systems engineering and systems management support of a highly sophisticated nature. To meet these needs, the SPECIAL PROGRAMS SECTION was established by General Electric in early 1959.

As prime contractor, SPS operates as a technical team which can focus and integrate the broad resources of the company on solutions to the most advanced systems problems. Our staff includes men with outstanding achievements in their own disciplines, and a thorough working knowledge of allied fields. (Over 50% hold advanced degrees.) Each sees his own technical field from the viewpoint of a total systems perspective.

Because of our increasing activity with the Army, we are now engaged in substantial augmentation of our staff. The men we are seeking will work with a small group of senior level associates in an informal atmosphere. All will have the opportunity to concentrate on a variety of advanced programs or follow a single one through its full cycle.

Immediate positions are open to highly competent engineers at our recently completed 2-story facility at Radnor, on Philadelphia's Main Line. (1961 starting dates can be arranged.) Required are 5 to 10 years' experience in one or more disciplines concerned with the following areas:

ELECTRONIC SYSTEMS
Navigation and Guidance
Computer Design
Infrared
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Radiation Effects
Applied Physics
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MISSILE SYSTEMS
Operations Analysis
Weapons Systems Analysis
Aeroballistics
Preliminary Missile Design
Arming and Fuzing
Airframe
Aerodynamics

For further information, write in confidence to R. Hildick, Dept. 141-MK

SPECIAL PROGRAMS SECTION | GENERAL ELECTRIC
Radnor-Chester Road Radnor, Pennsylvania
DEFENSE SYSTEMS DEPARTMENT

A Department of the Defense Electronics Division

tion as to just where such a post would fit in the organization of government. Three places are suggested: possibly a new super-senior cabinet post; possibly as a policy-making head of the National Security Council, with an enlarged staff; or a third solution, a super-Assistant to the President with authority over both Defense and State.

With all the new bridges being built across the Potomac River in Washington, Pentagon wags refer to the proposal as "another bridge across the river."

Secretary Gates has a special tri-service committee looking into this very quietly, making ready to propose suggested improvements to the new Administration. As someone has noted the Potomac could easily be bridged by using all the paper accumulated in smiliar previous "studies" as piling for the piers.

Field Army Missile Defenses

While Zeus pushes forward as an anti-ICBM, the Army is seeking ways to protect its field armies from enemy missile attack. Six contracts have been awarded for feasibility studies based on 17 study proposals submitted by industrial project teams.

The six contracts, for $250,000 each, were awarded:

Convair, Pomona, Calif., with Burroughs Great Valley Laboratory of Paoli, Pa. and Westinghouse Air Arm Division of Baltimore, Md.

General Electric Co., Radnor, Pa., with Chrysler Corp., Detroit, Mich.

Hughes Aircraft Co., Fullerton, Calif., with North American Aviation of Downey, Calif., Aeroject General Nucleonics of San Ramon, Calif., and R. G. LeTourneau of Longview, Tex.

The Martin Company, Orlando, Fla., with the W. D. Maxson Company of New York, N. Y.

Raytheon, Bedford, Mass., with International Business Machines of Bethesda, Md., Dunlap and Associates, Inc., of Stamford, Conn.; AVCO of Wilmington, Del., and Northrop Corp. of Hawthorne, Calif.

Sylvania, Waltham, Mass. with Aeronutronics of Newport Beach, Calif.

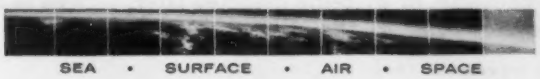
Today is obsolete...

The "breakthrough" of every sunrise symbolizes the day-to-day *race with obsolescence* which challenges our nation and its scientific teams. While many achievements today are awe inspiring, no technological group or organization can rest on its laurels in this highly-competitive cold war era.

To reach *beyond* today's horizon, with discoveries that are meaningful for tomorrow, is the goal of Sperry research. Toward continued progress in air and sea transportation and in critical aspects of national defense, our program encompasses research-in-depth under such headings as electromagnetic radiation, gyroscopic phenomena, electron beam interactions, materials sciences, mathematic analysis.

To some, the promise inherent in much we explore today may sometimes be hidden in such exotic terminology as magnetohydrodynamics, cryogenics, spin resonance, ion propulsion, plasma physics. In these and other fields, our resolve to bridge the gap between initial inquiry and reduction to practice will expedite the widespread application of these new technologies.

Research at Sperry will make continuing, significant contributions to our rapidly expanding environment as the nation and the free world seek a more peaceful and meaningful way of life. General Offices: Great Neck, N. Y.



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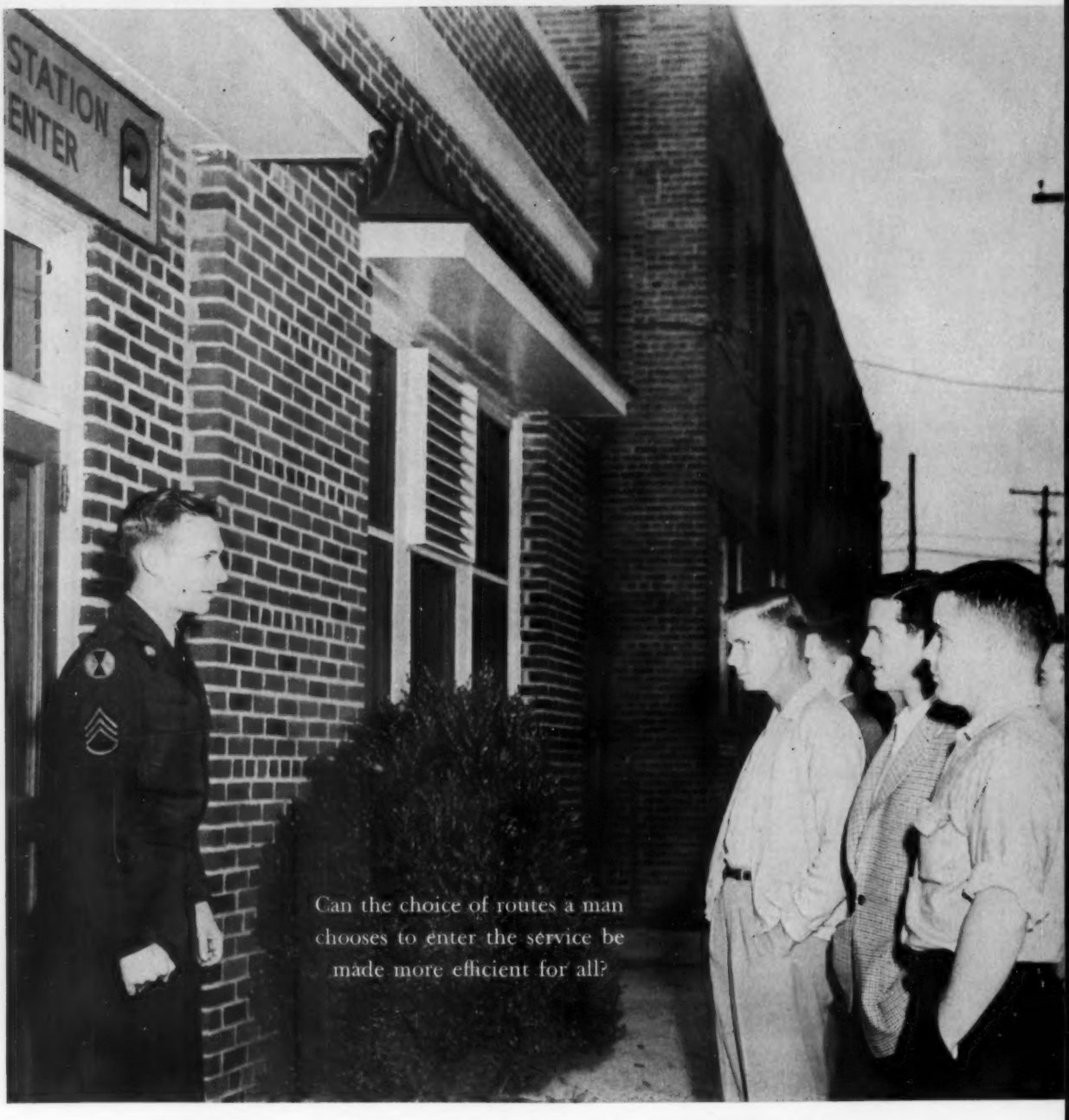
SPERRY



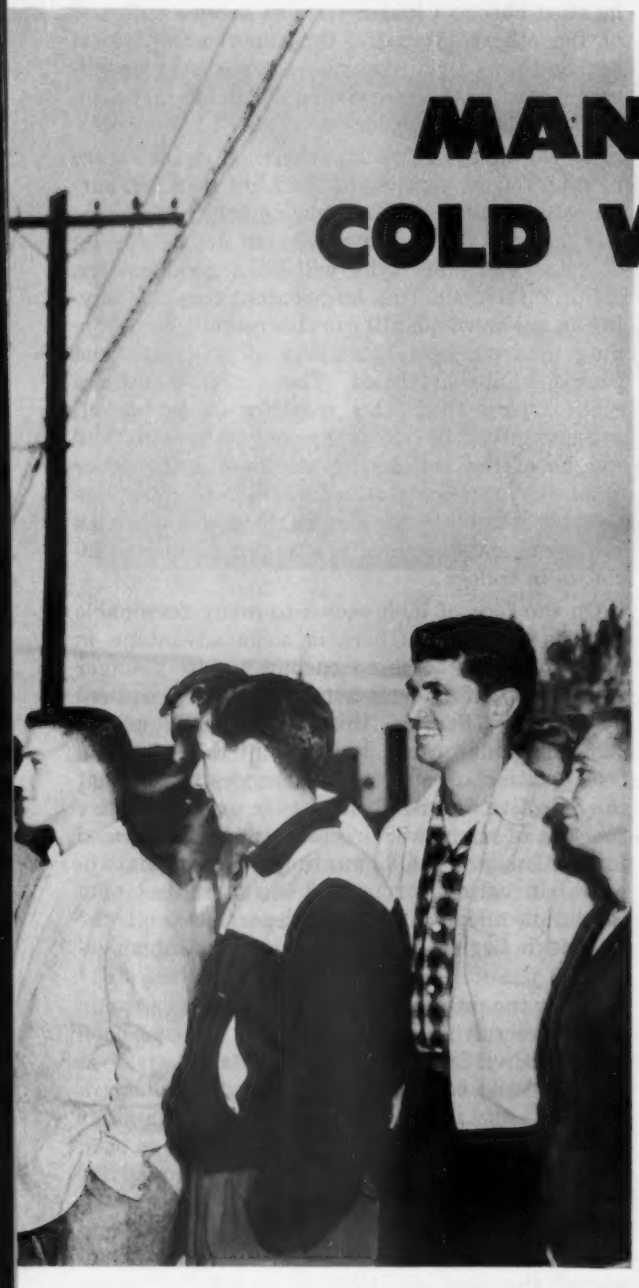
Can the choice of routes a man chooses to enter the service be made more efficient for all?

Colonel FRANCIS S. DRATH

THE Universal Military Training and Service Act by design has created a situation under which almost every able-bodied American youth must serve in either one of the regular services or a reserve component. He does this by volunteering for two years through his draft board at a time of his choosing, or by being inducted later. In effect the Act says to the nation's youth: "Young man, the choice is yours. Volunteer or face the prospect of being drafted." To make this condition possible, a system was set up which continuously processes men who reach an age when they are generally acceptable for service and keeps them sorted and classified throughout the period of their greatest military potential.

When the demand for men for the armed services is high, this system—Selective Service—fulfills the purpose for which Congress originally in-

MANPOWER FOR COLD WAR FORCES



tended it. When calls are low, as they have been for several years, and only 6,000 to 9,000 men are inducted out of the approximately 100,000 who reach the eligible age group monthly, it is apparent that the time could possibly arrive when not all the able-bodied, reasonably intelligent and morally acceptable men would be called up before they reached the age of 26. At that age they escape the clutches of the draft. However, because of the heavy deferments in this 100,000-a-month potential by fatherhood, dependency, service in the reserves, special programs for professional men and those with critical skills, and the tremendous loss of manpower into IV-F (the national average rejection rate now approaches 50 per cent), the time when a man may simply do nothing and yet escape a call keeps retreating just beyond the horizon.

People in the business of military manpower procurement generally, and usually willingly, admit that the UMT&S Act has been effective in encouraging men to enlist both in the regulars and in the reserves. The Act promises to continue to function effectively for a long time, and has supplied more than were called for through induction. Without its pressure, recruiting would be much more difficult.

Origin of a system

Originally, the peacetime Selective Service law was enacted to meet what looked then like a temporary situation following the scramble of World War II veterans to leave the services. That exodus depleted the ranks of the armed forces to the extent that the security of the nation was in grave danger. The Act has been extended from time to time because manpower procurement people in the armed services insist they cannot meet their requirements through recruiting without the shadow of Selective Service hovering near. The condition has continued for so long a time that none of the services can seriously maintain, without gross self-delusion, that their ranks are filled entirely by volunteers. The reserve components, historically completely volunteer, have had to accept obligors. (Obligors are men required by law to train with reserve components after completing active duty for training.)

In the cases of most new recruits, the threat of eventual draft is a compelling motive. Actually, the only true volunteer is the soldier who has completed a term of service of sufficient length that Selective Service has surrendered any claim upon him; this man has a completely free choice between continued active service and civilian life.

The armed forces persist in subscribing to the doctrine of voluntary service, because the true volunteer is a man dedicated to the defense of his country. A service forged with men of this stamp undoubtedly is superior to one made of men serving under enforced obligation. Any volunteer armed force can expect high morale and a well-developed esprit.

We must recognize that the man who enlists, pure volunteer or not, probably makes a more satisfied soldier than the one who is inducted. He helps preserve the illusion of a volunteer force for those services which maintain strength through recruiting. The man who enlisted may stay longer and leaves home with fewer regrets. He enters service with fewer gripes. He got himself in, and for a longer time than the man who was inducted.

The current system of manpower procurement for the armed forces is based in large measure on offering higher and higher monetary benefits for service. We keep pushing up the financial reward to a point where pay and fringe benefits will make a job in uniform more attractive than a civilian job. Thus the services recognize a shortage of the service-motivated persons who traditionally filled their ranks. By supporting the extension of compulsion through Selective Service, they admit that, being unable to bid higher than industry for the same skills and talents, they must depend on the threat of compulsion to keep up their strength.

Can something be done?

In view of this general situation during the past twelve years, thoughtful persons are inclined to review the whole picture of manpower procurement and wonder why the nation must spend $62 million annually for the recruiting services of the several armed forces. The recruiting services maintain 3,250 main stations and substations, and employ 10,000 persons. These recruiters are carefully selected, have high enlisted ratings, and most of them possibly have great potential value in specialties other than manpower procurement. At the same time Selective Service maintains nearly 4,000 boards at a cost of $29 million a year. On the face of it, it would seem there is a duplication of expense and effort that somehow could be reduced and possibly eliminated.

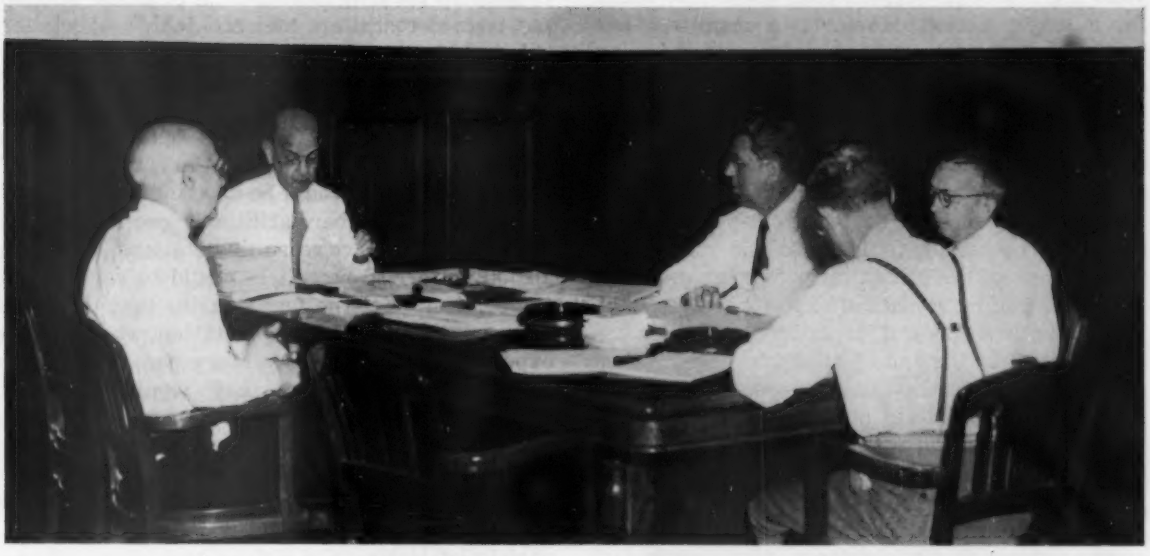
While the armed forces emphasize procurement of the young man with the longest potential service life, they also know from experience that the likely subject for the recruiter, either for the regulars or for the reserves, is the man who has had a physical examination by Selective Service and been found acceptable. This man knows that within the next few months he will probably be inducted. Therefore, if he thinks he has no liking for that service which needs men at the moment, he must choose a longer term of service with one of the others. Actually, the experience of local boards shows that recruiting efforts often are directed toward the man whose order for induction is impending.

So we have a situation where all agencies are bidding for the services of the same man. All participate in this scramble knowing very little about him, and vie for his favor without actually being able to determine if he will be a good soldier, sailor, or airman. To a large extent they are buying an unknown quantity in this recruit, like shopping in a supermarket where all the cans and packages are unlabeled. The recruiter hurries along trying to fill his monthly quota basket, snatching blindly, knowing only the size and weight of the articles he selects. On the other hand, the local board is in a position to determine a man's suitability for service. It taps youngsters in the manner that men are tapped for honor societies in college.

On the face of it, it seems to many reasonable persons that while there is some advantage in having a sales force to encourage the younger men to enlist for terms longer than that required by Selective Service, this advantage is not of sufficient consequence to stand in the way of a consolidation of efforts. One suggestion is that the Selective Service System take over the entire function of manpower procurement for the armed forces. This proposal is meeting with editorial approval in various parts, and is the subject of a resolution adopted by state departments of the American Legion and other interested organizations.

Under the proposed plan, all local boards would become recruiting substations. The clerk of each board, a Civil Service employee, would be trained to advise and counsel registrants who indicate a desire to enlist. He would have to become familiar with as many aspects as possible of service in each of the armed forces, and be in a position to advise the registrant in making his choice. Then, from a preliminary screening system, plus the information on file at the local board on each person registered, the clerk would determine whether or not the man might be suitable material. If determined a likely candidate, the registrant would be forwarded to an armed forces examining station for further processing by the military, and then turned over to the service of his choice for basic training.

There is no sound reason why a system of this kind wouldn't work, at least in its mechanical aspects. If not enough men presented themselves for enlistment, then the Selective Service System would call the additional men needed to keep the service concerned up to strength. Actually, the effectiveness of Selective Service in stimulating



The conscience and integrity of local communities and the United States come to grips with the obligations of a citizen to his nation in the local boards of the Selective Service System

enlistments could be stepped up enormously by increasing inductions to the point where every acceptable man, not already in the service or the reserve or deferred, would be certain of induction at a predetermined age. However, a shift to unlimited inductions cannot be seriously considered because it would mean removing the strength ceilings on the armed forces at a cost far exceeding any possible saving accomplished by abolishing recruiting. It would also bring down on Selective Service all the opposition encountered by proposals for universal military training.

Recruiting would be carried on at training centers where men completing basic training would be encouraged to enlist in a regular service for the normal tour. Recruiting would also be carried on at separation centers in an effort to reenlist men completing a two-year term, in the hope that the Government would profit by their extending their tour through enlistment in the regulars. Recruiting efforts at the end of basic training promise the greatest results, because at that time the recruit's enthusiasm should be at a relatively high point. Basic training marks the successful completion of his first military trial by fire, so to speak, and the soldier, sailor or airman is looking forward to a different, more exciting period of service at a higher rate of pay and with the prospect of promotion in sight.

On the other hand, recruiting at separation centers is psychologically bad. The selectee, having completed his two years, feels he is once more approaching freedom in spite of his reserve obligation, and wants to have a good taste of it.

Another advantage of recruiting among men who are already serving is that at the end of basic training or obligated tour of duty, the service concerned knows whether or not a man is likely to make a good soldier, sailor, or airman. Officers and noncommissioned officers have had a chance to observe him under service conditions, and know whether or not he is a likely prospect. Recruiting at this point would not be a blind rush for an unknown quantity, but an effort to persuade a man of tested quality that his opportunity for the future lies in service in his country's uniform. The high rate of discharges during basic training because of inaptitude and unsuitability, indicates the errors in selection made by the current system of manpower procurement.

Complications, including rapid turnover

There are complications, however. The Selective Service Act stipulates that no one can be inducted involuntarily for longer than 24 months. If the number of men who volunteered under the proposed plan falls short of service needs, then vacancies would be filled by two-year men in place of the four-year men now enlisted in the Air Force, the Navy, and generally speaking, three-year men in the Army. Hence, to keep the armed forces at their current strength, there would be a much larger turnover as a result of this change in handling manpower procurement, since it is only reasonable to assume that with no recruiters out beating the bushes the number of volunteers would decline.

Neither the Navy nor the Air Force is anxious to fill its ranks with two-year men. The Army too is reluctant to take any more two-year men than necessary. The investment in a private in basic training and schooling is high, and two-year men

yield much smaller returns than those who enlist for a longer period. Moreover, a man who has been inducted without having demonstrated any interest in serving, is psychologically motivated to accept separation at the earliest possible opportunity.

Since the term of involuntary induction is for two years, and the turnover of two-year men naturally is higher than that of four-year men, it might be necessary to increase the number of men in each of the armed services so as to retain the number of man-years of experience at current levels. In other words, if, depending on the success of recruiting at the end of basic training, it takes almost twice as many two-year men to keep a service at a fixed level of experience as it does four-year men, then an important factor is the cost of training two men to do a job for four years that one four-year man would do.

Hence, the armed forces cannot possibly welcome a system that might force great numbers of two-year men into a service that now functions on strictly four-year enlistments, not only because of the cost but because of the lower experience level that would result. Nor is Congress likely to become enthusiastic about it, if to maintain the current experience level would mean a considerable expansion of all the armed forces in men, together with a higher cost of maintaining the larger organization.

Induction for four years

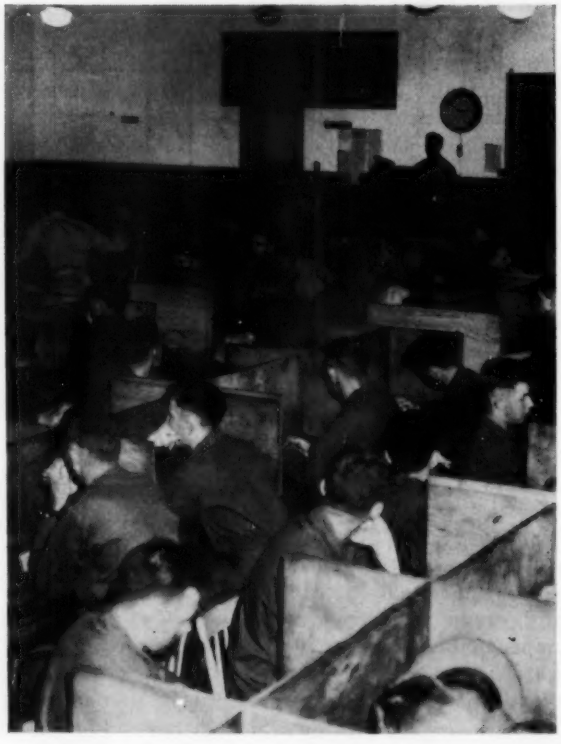
Obviously, the way to overcome this obstacle under the proposed system, where Selective Service takes care of all manpower procurement, would be to induct men for four years when the number of volunteers falls short of the demand. Four-year induction, however, is unlikely to be acceptable to either Congress or the general public. There is great opposition to any sort of compulsion that will be augmented under this proposed change. Those who are now neutral on the question of compulsory military service oppose even two years, because this is a longer term than any of our allies have placed upon their young men. Thus, the four-year term for inductees seems to be completely out of the picture. It will take a much more desperate situation than the current one to bring about a revision of the Selective Service Act which might extend the term of compulsory service to four years.

Civilian recruiters cost as much as uniformed

Even now, with the draft in force, recruiters of all services, busy selling men into enlistment, are having difficulty in maintaining strength. Without these beaters in the field, increased inductions seem inevitable. Given full procurement responsibility, if Selective Service in the effort to keep up the flow of long-term enlistees were to put trained recruiters into the field to solicit for the armed forces, at least some of the financial advantage of abandoning the uniformed recruiting system would be dissipated. The establishment of such a recruiting force for Selective Service would become as expensive as the current cost of recruiting. There would be a saving in the use of office space and other facilities, since local board offices would replace recruiting stations, and some 10,000 uniformed recruiters would be returned to the services. Yet the fact remains that the civilians employed in field solicitation would be as expensive per capita as military personnel, while there is no assurance they would be more productive.

When the civilian recruiter has been trained and ventures forth, he will be selling not one service but at least four, with an assist to the National Guard on occasion. The salesman who handles a variety of products is not as convincing as one who pushes a single line. And while one man replaces three or four in uniform, his effort is scattered, dissipated, rather than concentrated on a single objective. Almost inevitably he will be accused of favoritism by that service which profits least from his efforts. No matter how hard he may try to be fair and impartial and fit the serv-

New airmen in a maze of cubbyholes are tested for intelligence and latent skills



ice to the needs of the prospect, he cannot possibly sell with the intensity and conviction the service recruiter generates. His sales effectiveness cannot be expected to measure up to that of the dedicated man in uniform. The incentive of competition among the services would also be missing.

It is true that the civilian beater will have the advantage of access to Selective Service records. He goes forth armed with a list of prospects about whom he knows a great deal, including some conception of what service might be most suitable for each person. On the other hand, in order to sell, to meet his quota, as an agent of Selective Service, he may be tempted to imply a threat of summary induction, imperiling by such abuse the respect the Selective Service System has built up through the years.

The ratio of drafts to enlistments

Throughout the experience of Selective Service it has been demonstrated that high draft calls are followed by increased enlistments, and as the need for men diminishes and calls fall off, enlistments decline. Since Korea this cycle has been subject to adjustment by the fact that the armed forces have been shrinking, and with it the need for manpower. However, if a point is reached at which strength is stabilized, and a hybrid system such as that proposed is inaugurated, we can expect a cycle of heavy demands, followed by a high rate of enlistments; then light calls because the demand is satisfied, followed by a low rate of enlistment to the point where draft calls must be stepped up again. While this sequence is not new in the nation's experience in manpower procurement, its effect would be exaggerated in the situation where we depend entirely on volunteers, with draftees filling shortages. Not only would the Navy and Air Force, now geared to four-year men, have to adjust by filling gaps with two-year men, but the flow would not be steady. Further adjustment would have to be made to months of low intake of short-termers followed by months of intake of two-year men in large numbers. This prospect is frightening to the services which cannot utilize short-termers at all with any satisfaction.

Uniformed recruiters assigned to SSS

An alternative to employing civilian beaters is the assignment of recruiters of all services to the Selective Service System. Here they would solicit from local board offices, under the direction of the Selective Service System. There is a distinct possibility that, working under such an arrangement, the recruiter would be more effective than one working under current conditions, since he would have the advantage of Selective Service

The eyes of novices rapidly becoming soldiers peer out of gas masks on a bazooka firing line

System files in his pre-solicitation preparation. As with the civilian beater employed by Selective Service, examination of the files would permit the uniformed recruiter to eliminate many prospects without a personal interview. The files would afford him a relatively accurate picture of the registrant's major physical defects, education, and other personal data. One objection to current recruiting practice is that it is a hit-or-miss proposition, a disorganized solicitation of any prospect the recruiter stumbles on. The potential engineer, doctor, or scientist is accepted as readily as is the master mechanic or other skilled craftsman.

The Selective Service System defers for education purposes those who have a greater potential of contribution to the national welfare through advanced training in science or medicine. It puts aside those whose responsibilities to dependents and humanitarian considerations make them poor prospects for military service. Selective Service

The art of pitching a pup tent by the numbers is imparted by a Marine Corps drill instructor

procedure is much more orderly than the recruiting process. It is not a sales campaign with one recruiter competing against another to meet quotas in order to remain on an assignment which usually is to his liking. In this highly competitive world we cannot afford to be prodigal with our human resources.

Making Selective Service facilities available to recruiters should bring more order into the manpower procurement process, yet at the same time complications become apparent. Aside from the problem of who is to administer the uniformed recruiters assigned to Selective Service is the fact that merging of a purely manpower procurement activity and the civilian process of Selective Service disregards to a large extent the civilian aspects of the System. Civilian control is one factor Congress had in mind when it established the System as it now stands. There would be serious objections to making Selective Service an adjunct of the Defense Department.

Selective Service is tolerated by Americans because it meets a major need in a continuing emergency. To make it a part of the Defense Department alters the entire face of this aspect of manpower procurement, and the System would then run headlong into the traditional objection to compulsory military training. Actually, the success of Selective Service as operated during the past 12 years has grown out of the fact that it is always in prospect of disappearing. At the very worst it is a civilian activity not controlled in any way by the military.

Another difficulty that might arise from assigning recruiting to Selective Service is that members of local boards, who serve without pay, might object to becoming unpaid administrators of the recruiting system. This situation might also arise under a system where Selective Service is assigned complete responsibility for manpower procurement with no assistance or services from recruiters. Under any conditions, the task of procuring manpower for the armed forces is a complicated one. There seems no prospect of completely eliminating either the Selective Service System with its compulsion, or the recruiting system with its expensive scramble for recruits. If local boards were willing to assume the responsibility, there is certainly one area where there could be greater cooperation between local boards and recruiters: Selective Service maintains a running inventory of manpower classified according to the circumstances of each case.

Perpetuating compulsion

A merger or compromise seems necessary if any substantial saving is to result by eliminating duplication of recruiting activities. Probably the greatest obstacle to a joining of recruiting forces, whether under civilian or military control, or even some sort of compromise, is the fact that by so doing we are recognizing officially that the Selective Service System must be perpetuated indefinitely as part of the manpower procurement organization of the armed forces. Congress and a large percentage of our people cannot willingly accept this if they fully realize the implications of the change.

Any way you figure it, there seems to be no easy solution. If the field is left to Selective Service and the $62 million for recruiting is cut from the budget, we cannot expect the System's cost to remain constant. Actually, it would seem that the cost of Selective Service plus recruiting could rapidly approach the current total for both operating separately, with greatly increased field forces costs and many added complications besides the financial. Certainly if Selective Service is eliminated, together with the $30 million representing its cost, recruiting is going to cost more than it does now, and it may not be able to do the job.

The price of liberty is high, and it soars with inflation. Alternatives to the current system cannot promise marked savings, nor can they guarantee the over-all cost might not run higher than it does now. Constant re-examination of every process of defense is justified, but there is no merit in change only for the sake of change.

For its work in "furtherance of the Army mission" the 1st Reconnaissance Squadron, 16th Cavalry, Fort Carson, Colo., was the first unit to receive the Hughes Army Aviation Trophy (reproduced above) to be awarded annually to the Army Aviation unit that outstandingly contributes to the development of command mobility in the Army. The trophy, awarded by the Aircraft Division of the Hughes Tool Co., reflects the interest of Mr. Howard Hughes in the development of manned aircraft.

ARMY AIRPOWER AND THE ARMY MISSION

Airpower is divisible. There is airpower that prosecutes the air war. There is airpower that supports the fleet. And there is airpower that supports the Army on the ground. The latter was the only kind there was in the early days of military aviation. But as aircraft flew faster and higher, airpower in direct and close affinity with the ground disappeared. The lack of it circumscribed the mobility and combat effectiveness of ground armies during the Second World War. But today the gap is being filled by Army Aviation. Airplanes and helicopters of great versatility are becoming ubiquitous in the Army. The hows and whys of this are discussed in the 19 pages that follow. They provide a review and a preview of Army Aviation . . .

In a demonstration of the growing proficiency of Army Aviation, seven world helicopter records were broken in 1960 by three U.S. Army aviators flying the Bell HU-1 Iroquois. Two of the aviators, shown right, are Chief Warrant Officer Clifford Turvey and Major Garrison J. Boyle, III. The third is Colonel Jack Marinelli, President of the Army Aviation Board. The records broken were in speed, distance and climb categories. Three of the records were previously held by the Russians.

For an insight into
ARMY AVIATION
What it can do . . .
Where it is going . . .

It's not an arm, it's not a branch, it's found everywhere in the Army

The Army's Organization for Aviation

THERE is no aviation chain of command in the Army. Army aviation is deliberately fragmented through the various branches and at all levels of command in following its basic principle of being organic to the organizational level that requires aircraft on a full-time basis. Obviously there are disadvantages in not having one agency as an absolute authority in all Army aviation matters, but the Army believes that proven combat organizational advantages outweigh them.

How, then, does Army aviation run its business? How does it develop doctrine and hardware? Let's look at the main elements concerned primarily with aviation within the Army.

The Director of Army Aviation discharges the responsibility of the Deputy Chief of Staff for Military Operations for overall staff supervision and coordination of functions relating to Army aviation. This office is the principal focal point for coordination of Army aviation with other Army Staff agencies, other military services and government agencies.

To cite a few examples, the Deputy Chief of Staff for Personnel is responsible for controlling and managing all Army manpower resources. Army aviators and related aviation-skilled officers and men are administered generally through normal personnel procedures. But the requirement for some special management has been recognized and the Deputy Chief of Staff for Personnel has a special aviation officer in the classification and distribution division to exercise staff supervision for aviation manpower management.

Similarly Army aviation staff officers are assigned to the Deputy Chief of Staff for Logistics to supervise logistic responsibilities in the areas of procurement, requirements, supply, maintenance, and planning. This coordination includes the activities of the Technical Services having direct responsibilities for support of the Army aviation program.

The Chief of Research and Development is responsible to the Chief of Staff for planning, coordinating, directing and supervising all Army research and development. In the case of Army aviation, this responsibility is carried out by aviation personnel within the Air Mobility Division.

The Office of Assistant Chief of Staff for Intelligence has an Army aviation staff officer responsible for all intelligence aspects and application of Army aviation. The sum of these functions includes Army requirements for weather service and coordination of those requirements with the Air Force.

Within the Office of the Chief Signal Officer we have the following divisions having identifiable Army aviation elements: Combat Developments and Operation, Research and Development, Procurement and Distribution, and Personnel. We have a growing requirement in the field of avionics and combat surveillance.

The Office of Chief of Transportation is organized to include a Deputy Chief of Transportation, Army Aviation, who advises the Chief of Transportation on a continuing basis with respect to the status of all elements of the Army aviation program that fall within the responsibility of the Chief of Transportation. He obtains, from the Director of Army Aviation, ODCSOPS, short and long range operational requirements for Army aircraft by type. The Transportation Corps has the major responsibility for procurement and maintenance of Army aircraft.

Almost without exception every DA agency has some responsibility in the field of Army aviation. Those agencies already considered have major responsibility for the program. The overall coordination and supervision of such a diversified program places a tremendous responsibility upon the Director of Army Aviation. The real key to the successful accomplishment of this task is coordination. There are certain disadvantages to management by coordination; however, this system tends to keep the Army aviation program in mesh and in balance with all other important programs within the Army, and has provided for a rapid but orderly growth of one of the Army's fastest growing elements.

Maj. Gen. RICHARD D. MEYER
Dep. Chief of Transportation (Aviation)

Brig. Gen. CLIFTON F. VON KANN
Director of Army Aviation (OPS)

Maj. Gen. E. F. EASTERBROOK
Commandant, Army Aviation Center

SOME KEY FIGURES IN ARMY AVIATION TODAY

Col. JOHN NORTON
Chief, Army Aviation Sec., CONARC

Col. JOHN L. INSKEEP
CO, Primary Helicopter School

Col. JACK L. MARINELLI
Director, Army Aviation Board

Col. ROBERT R. WILLIAMS
Chief, Air Mobility Division (R&D)

What about Army aviation outside of the Department of the Army Staff? Most major organizations have a special Army aviation staff section with functions analogous to the over-all functions of the Director of Army Aviation. However, there are some other elements which deserve special attention.

The Commanding General, USCONARC, has special responsibilities in aviation which are handled by his Deputy Chief of Staff for Materiel Developments and his Deputy Chief of Staff for Combat Developments. The aviation personnel in these offices work directly with the U. S. Army Aviation Board and the U. S. Army Aviation School in developing materiel and formulating doctrine and concepts.

At the Army Aviation Center at Fort Rucker there are major elements of the Army aviation program. The Army Aviation School, beside its important basic mission, has a Department of Combat Developments to project future organizations, doctrines, and concepts. This department had a major responsibility in the development of the "air cavalry" organization.

Also making their home at Fort Rucker are three organizations that work very closely in testing Army aircraft and associated equipment: the U. S. Army Aviation Board; the Transportation Aviation Test and Support Activity (TATSA); and the Signal Corps Aviation Test and Support Activity (SCATSA). As a new aircraft is phased into the Army inventory, the Aviation Board is responsible for its service test, and TATSA and SCATSA support the Board and perform concurrent logistical testing. The Aviation Board reports directly to CG, USCONARC, while TATSA and SCATSA report through their respective technical service channels.

Finally, the training of Army aviators and other aviation-skilled personnel is conducted at Camp Wolters, Texas, and Fort Rucker. At Camp Wolters is the Army's Primary Helicopter School where fledglings learn to fly the whirlybirds. Comparable instruction in fixed-wing flying is conducted at the Aviation School at Rucker.

This résumé is not intended to be a complete picture of Army aviation, for the heart of this program is its effect on the Army's combat potential. It is the responsibility of Army aviation personnel and organizations to translate the various aspects of its activities and equipment into capabilities that will aid the combat commander on the ground. In the end, he is the man who "owns" Army aviation.

ARMY AVIATION

AVIATION, signifying many different things to different people, is one of the most misunderstood activities of the Army.

- To students of military history it represents a fascinating innovation in mobility.
- To the ground commander it represents new capabilities accompanied by new problems.
- To the logistician it represents a quick way to move people and things, but has added difficulties in procurement, maintenance, and programming.
- To the comptroller it represents a high cost and therefore an unpopular item.
- To the airframe manufacturer it represents hope for a new market tempered by confusion as to the firmness of the demand.
- To the average citizen it is a fuzzy area best described as some sort of remnant of the pre-1947 Army Air Corps.

These are only a few reactions to Army aviation which consequently finds itself with many friends, some enemies, and a far greater number of people who couldn't care less. The ambiguity is compounded by the fact that Army aviation has made great progress in some ways, but in others has encountered tremendous problems. Some of these problems are self-evident, but perhaps the most difficult of solution is personified by a colonel wearing not a blue uniform, but Army green. He is a professed friend of Army aviation, a highly decorated combat veteran, a soldier who has enjoyed important and distinguished assignments and who is considered general officer material.

Let us listen as he unwinds in his Pentagon office late in the afternoon of a typical Day of Crisis. His tone, while a bit emotional, has a ring of sincerity, an honest viewing-with-alarm.

"What are you aviators trying to do? Every time I read an article or speech in one of our journals, it's more airplanes, more helicopters, more pilots and more money for aviation.

"Now don't get me wrong. I'm all for you people and all for air mobility, but that isn't the *only* problem in the Army. What's so special about flying? What we really need is a bunch of flying sergeants and some cheap, rugged, flying jeeps. Assign them right to the infantry companies and forget them! You've been taking significant steps backwards, in my opinion, since you got rid of the L-4 Piper Cub!

"Why in the ever-loving, blue-eyed world must you have officers to drive airplanes? And why should they get paid so much to fly? Here we have

The goal is an air-minded, air-mobile Army

Brig. Gen. Clifton F. Von Kann

hundreds of young officers sitting around some airfield while my company officers are beating their brains out. And the cost! You're buying million-dollar helicopters and we're still running around with World War II rifles and World War I pistols! Where's it going to end?"

Our friend has raised a number of questions which are in many people's minds and which we in Army aviation must answer fairly and squarely. This we will try to do. However, by way of backdrop it may be well to examine why at this moment in the Army's history there is such a compelling need to capitalize on the advantages which aviation offers.

During the past few years much has been said of mobility; in some ways the subject has been talked about at such length that one must wonder whether everyone is quite clear in his mind about what mobility really means. I like to think of it as a goal—and an elusive one at that—which military commanders have been seeking throughout history.

The search for mobility breakthrough

Time has always been a critical factor in battle. It used to be an accepted principle of combat that if you could find some way to bring your main

Army aviation helicopter outfits were ubiquitous agents of mercy to victims of the disastrous earthquakes in Chile a few months ago. Helicopter ambulance units treated more than 200 patients and examined and vaccinated more than 600 others in the first three days of operations. In addition, many tons of relief supplies were flown into otherwise inaccessible areas.

AIRCRAFT FOR THREE IMPORTANT COMBAT TASKS

Left: The DeHaviland AC-1 Caribou, a short take-off and landing aircraft that can carry three tons or 32 troops from an unimproved runway.

Center: The Grumman AO-1 Mohawk, a twin-turbine, 2-place observation aircraft that can carry a wide variety of modern surveillance gear.

Right: The Beech L-23F Seminole, an "off-the-shelf" aircraft, has many uses as a utility transport.

force to a key point on the battlefield more quickly than the enemy assumed possible, the chances were very great you would carry the day. The same reasoning applied to the defensive. If you could react to the enemy's thrust with equal celerity, he would probably fail in his effort and lose the engagement or, better yet, be vulnerable to your counterattack. Thus if we find any common thread running through military history it is this search for mobility breakthrough. Further, the Great Captains were great because they achieved such breakthroughs by innovations which gave them advantages they were able to exploit decisively.

Aviation offers unique possibilities for such innovations. The Navy offers a good example of what happened to a military force when exposed to a radical change in tactics brought about by the introduction of aircraft. I am speaking of the fast carrier task force of World War II. Now I don't believe that Navy people are smarter than anyone else, and I am sure there were many in the Navy who were astonished when the carrier task forces replaced battleship fleets and revolutionized naval tactics. The purpose of naval warfare remained the same: by defeating a hostile fleet, to control the sea for our nation's uses. But the practical weapons by which these objectives were achieved were entirely new. The fast carrier task forces out in the vast Pacific exerted their influence over a radius of 300 or 400 miles. They were able to control everything within this radius by extending the mobility of the surface force by using the greater mobility of the aircraft on their carriers.

There is much in this example that can be applied to the land battle, and in many ways aviation has more to offer over land than over water. For on land we can combine the two most mobile elements in warfare: the foot soldier and the airplane. In the past this application was limited because the airplane could not live with the foot soldier on the battlefield and be immediately available for use in ground maneuver. But now as we see this obstacle falling to technological advancement in the form of turbine-powered helicopters and excellent STOL aircraft, the way is clear for flying soldiers in the true sense of the word.

Aviation also allows us to turn a potential weakness to our advantage; the pay-off here lies in smallness, mobility and quality. Since a small unit may readily be afforded the same atomic support as a large unit, it follows that a small, highly skilled, agile, alert group stands a first-class chance of destroying a larger and heavier one. Elusiveness and dispersion now provide the greatest chances of survival. Mars is no longer on the side of the biggest battalions.

The 'high ground' when and where you need it

Aviation on the battlefield also solves the problem of "the high ground" in an atomic war. Although dominating terrain may still have influence, it probably will not always be necessary or desirable to seize and occupy that terrain with strong forces. It is possible to visualize many situations in which any force which occupies the highest hill will be detected instantly and as quickly obliterated. But if an aerial platform allows you to move the high ground to where and

when you need it, terrain becomes less important. So a piece of ground which in World War II would have been the prize possession of the local area, might in the next war be avoided by both sides.

Aviation gives a new meaning and significance to obstacles. In addition to the natural and artificial battlefield obstacles of the past, nuclear warfare imposes new and worse ones: areas contaminated by radiation, woods and fields set afire by blast, wide regions in which bridges are down and the towns reduced to rubble across the roadways. The side which possesses the greater ability to overcome these obstacles will have an enormous advantage.

All this adds up to a rather strong case for air mobility for the Army because of what it can do in the face of the revolutionary changes which nuclear weapons bring to the battlefield. However, there is an even more compelling factor: the surprising but inescapable fact that in our day a ground-bound army is no longer mobile. Up to World War II our thinking was based largely on temperate zones, and much of our military gear is still designed for such climates. However, World War II, Korea, and the succession of brushfire wars tell us that we may be called upon to fight anywhere between the Poles and quite possibly on the Equator.

Now an analysis of ground trafficability, even if we restrict ourselves to the relatively favorable picture along the periphery of the Iron Curtain *(see map page 47)*, demonstrates that a very substantial portion of this area prohibits the wide use of ground vehicles, and tremendous engineering effort would be necessary if they are to move at all. It is difficult to escape the conclusion that only an air-mobile force has true mobility in the Arctic's muskeg or the virtually impassable jungle. The recent events in the Congo illustrate the point vividly. Here some of the belligerents were armed with bow and arrow; yet the key to success was held by that side which could control the airfields and the lifelines of air transport.

Desire, but few wings

Now how squarely have we faced these developments? At present I have the impression that we would like to be air-mobile, but would prefer to attain this happy state without bothering with aircraft, aviators and related problems. We are willing to staff long-range plans calling for aerial brigades in 1975, but we have taken upwards of five years to realize even a platoon borne in its own fighting air vehicles. In short, are we making the effort we need to make our dreams of air-mobility come true?

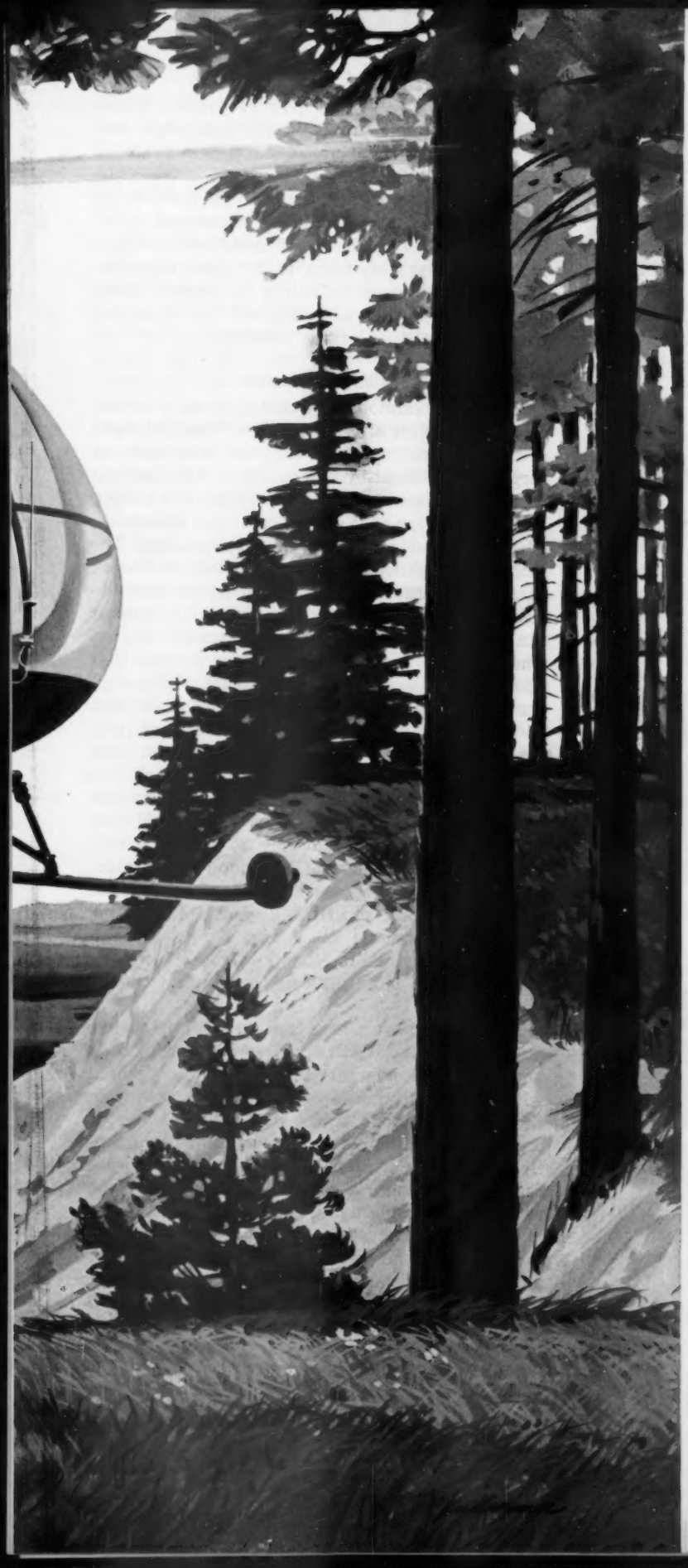
The hard and unpleasant fact is that air mobility does not come easily. We may as well recognize that if we really want to move through the air, to do it we need not only courage and determination, but aircraft, people and dollars.

First let us look at the hardware, for the nature of the equipment has a great bearing on the personnel, training, and cost. The Colonel said that Army aviation reached its peak with the L-4 and has since been on the decline. From the standpoint of not bothering higher commanders this is probably true. The artillery battalion commander was issued two Piper Cubs, two pilots, perhaps a spare propeller, and that ended the logistical effort. The battalion commander in turn told his pilots to find an airstrip within a couple of hundred yards of the CP and report when they were airborne and ready to observe.

From the standpoint of long-range efficiency, the picture was not so simple. Usually the pilot had to be his own mechanic until one could be trained. Airplane engines didn't always run on truck gasoline. The best thief had the best supply system.

It wasn't long before we recognized that we needed a division artillery air officer to supervise and help. Experience also showed that while you can run small planes a long time on emergency repairs on the spot, eventually they must have

(Continued on page 46)



The ideal Light Observation Aircraft

PROBLEM: To provide a *Light Observation Aircraft* for military use for:

- Visual Observation Missions
- Target Acquisition Missions
- Reconnaissance Missions
- Command and Control Missions
- Necessary utility tasks required at the combat Company level.

SOLUTION: The Light Observation Helicopter...a concept pioneered by Hughes and demonstrated in the Hughes *compact* helicopter:

...whose small size, quick response and minimum silhouette make it a difficult target to locate and attack,

...with superior handling qualities, outstanding performance and a small rotor diameter which enable it to operate in confined areas denied to other craft,

...whose rugged construction, easy maintainability and reduced logistic requirements permit around-the-clock combat area operations in even the roughest terrain,

...with a speed capability adequate for completion of all mission assignments *without sacrificing:* range, rate of climb, hovering ability, confined area performance or ease of maintenance—*without increasing:* initial cost, operating costs and logistic support requirements.

World-wide Army field tests of the Hughes YHO-2HU have proven the mission capability, reliability, ease of maintenance and performance of the compact helicopter for command use in Company-level combat operations.

HUGHES TOOL COMPANY
CULVER CITY, CALIFORNIA

Aerojet-General's SD-2 short-range surveillance drone

Fairchild's SD-5 long-range surveillance drone

Republic's SD-4 medium-range surveillance drone

(Continued from page 43)

spare parts. The World War II ground forces learned very slowly (and usually painfully) that aircraft have tremendous advantages and, also, a few special problems.

The L-4 did a tremendous job in spite of its shortcomings. But as missions broadened it became more obvious that a lot more could be done with more payload, more radios, and more endurance. It seemed ridiculous to expect Army aviation not to take advantage of the expanding technology of the aircraft industry.

The machines are battle-oriented

However, I cannot agree that in moving toward bigger and better aircraft the Army has lost sight of the environment where they are to be used, or forgotten the front-line commander. The Caribou, carrying 32 men, could have operated out of many of the L-4 strips of World War II. The helicopter, of course, can go places no airplane can. The Mohawk can penetrate enemy territory and bring back target information from a depth never attemped by the L-4 or L-19. The Chinook helicopter can move loads like the Pershing missile to anywhere on the battlefield. Each new aircraft has added a vital new combat capability. Yet our inventory projections to 1970 show that more than 75 per cent of the inventory will consist of light observation and squad-carrying helicopters. Does this seem like abandonment of the battlefield?

Granted the curves of complexity and maintenance have been on the upswing since World War II. This has been due mainly to the relatively young state of the art of helicopter experience; but now we can see a definite downward trend toward simplicity and reliability. Turbine power, long-life components and design for easy maintenance are paying off. Now the Army's new helicopters are no more difficult to maintain than a tank.

Aircraft do have a long lead time. Many models now being designed will probably be flown by boys now entering kindergarten. Those not acquainted with the steps from drawing board to hardware in the hands of troops expect the ideal vehicle now, and accept nothing less. However, for all our optimism, the flying saucer that is controlled by a few push buttons is far from reality, and the rugged and simple flying jeep that an untrained man can just "drive" is somewhere beyond 1970. We are moving toward a new and better family of aircraft for this decade, but they will still look like airplanes and helicopters, and their use will still require special skills and training.

Aviators are people who live risky

Which brings us to people. What about our aviator program? Must flyers be commissioned

officers? The other services have tried many plans that involved flying sergeants, non-commissioned flight officers, and flying petty officers. None were particularly satisfactory, and all were abandoned. When the Army proposed its warrant officer aviator program, it was warned of the pitfalls involved. Nevertheless, because of the problem of officer grade structure, the Army moved ahead with its warrant officers, and it has been eminently successful. This fine group of pilots are assigned to positions where the principal duty is flying. We hope to see the percentages of warrant officer aviators increased so that they can meet most of the full-time flying requirements. But there will continue to be an urgent need for commissioned aviators in command and staff positions; officers who can develop air-mobile techniques and doctrine and provide technical supervision.

Flight pay is one of the most controversial aspects in the whole question of Army aviation. While volumes have been written on the subject, it boils down to this: if you fly constantly over a period of years your chances of reaching retirement are considerably less than those of the nonflyer. Our insurance companies recognize this cold fact. The percentage of pilots killed each year is greater than in any other military specialty. Any pilot can tell you there are moments in the air that one would give a year's flight pay to avoid. I write letters of condolence to about 30 new widows a year who do not have to be told of the hazards of flying. Flight pay is definitely not a monthly bonus for meeting minimum flight requirements.

However, as we move toward integration of units and aviation such as our "air cavalry" troops we will have to take a new look at flying pay. The ground soldiers who are part of this completely air-mobile unit will be in the air as often as rated personnel, and will be facing the same flying hazards. I feel that we will have to recognize that the entire group rightfully deserve hazardous duty pay. At the same time we must take a searching look at our entire system to see if the pay scales borrowed from other services really reflect a fair balance of hazardous duty pay among our other risky specialties.

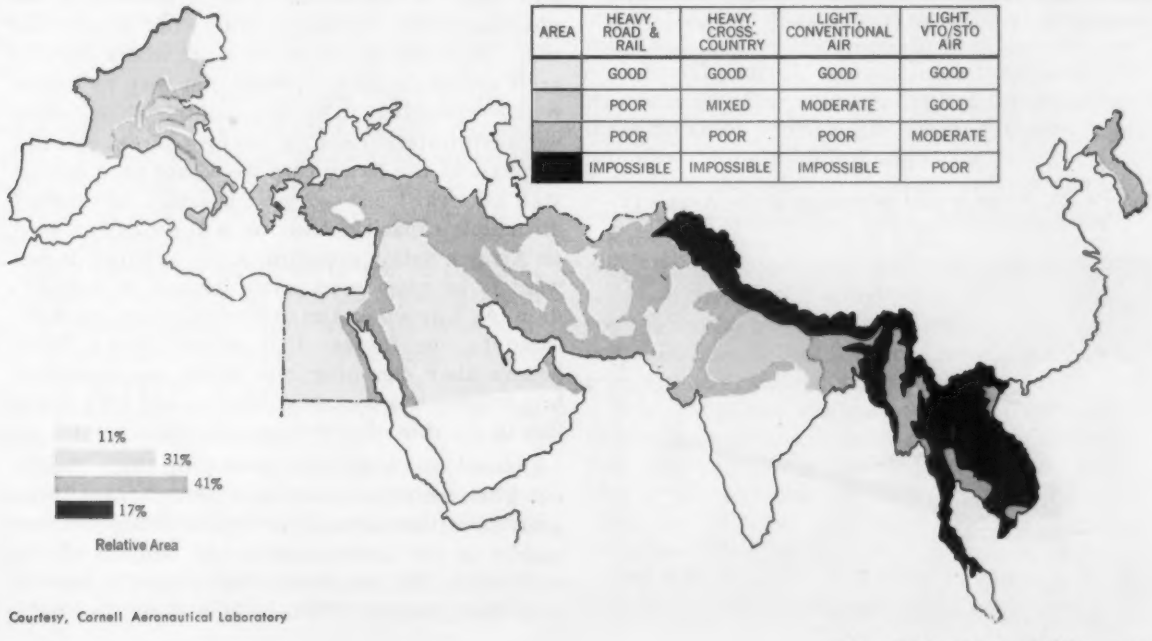
Cranking capabilities into cost analysis

Now to the cost of the program. Everyone knows that aircraft are expensive. However, on the basis of round-for-round cost, the Honest John system does not come out too well compared to the French 75. Such comparisons are fallacious unless you look at the capabilities.

Old staff studies on the transition from horse to truck include thousands of papers proving that the cost would preclude making such a change. Statistics on hay and grain versus oil and gasoline offer irrefutable evidence that the horse will always be cheaper than the truck. Nonetheless, the change was made because someone saw we could not afford not to!

If an air-mobile unit can cover an area that

GROUND TRAFFICABILITY PATTERN ALONG THE PERIPHERY OF THE IRON CURTAIN



Courtesy, Cornell Aeronautical Laboratory

COPTERS IN THE NEWS

Bell H-13H observation copter, loaded with two SS-10 missiles

Mock-up of Vertol's HC-1B Chinook, a twin-turbine transport

Hiller's 23D Raven is used extensively at the Army's Primary Helicopter School at Camp Wolters, Texas

would require four or five ground units of the same size, if it can be supplied by air directly from a remote base rather than through an expensive and vulnerable LOC, then maybe the initial cost of its equipment is worth every dollar.

Today we are devoting about 10 per cent of the Army's resources to aviation. We do not expect to raise that percentage much over the next ten years. However, with the modest increase now planned we hope to achieve real progress in air-mobility, even though it is well recognized that ground travel will remain the principal means of movement through 1970. The main point is that the Army has made the basic investment in its aviation plant, and a very little additional investment can yield great gains in air-mobility.

So somewhere along the line we must meet the same questions the Navy faced about dropping battleships or carriers. If we believe in air-mobility and want it, we must be prepared to pay for it.

Only we in the Army can decide how important air mobility is to the Army's future. Only we can take positive steps in that direction. Aviation can be a new dimension or it can be a hindrance. It can be part of the combined-arms team, or it can be an unneeded luxury. Our aviators will be either flying soldiers or fly boys. We will face a realistic decision soon, one that will determine if Army aviation is to be a disease or a cure.

Paradoxically, Army aviators can do little to influence this decision without being charged with building an aviation empire. Recognizing this, Army aviation seeks no separate branch status, no compartmentalization. Also paradoxically, our ultimate goal is the disappearance of "Army aviation." When we arrive at the stage where our aircraft are so simple to operate that they no longer require specialists to fly and maintain them; when we accumulate enough technical experience throughout the Army that we do not need special staff officers; when we have a firmly established air-mobile capacity; then we will no longer need an Army aviation program. Army aviators do not want to be considered prima donnas or stepchildren. As a group and as individuals they are dedicated to one future: that of the Army. They believe they can offer the Army an important breakthrough in mobility. They would very much like to see this offer enthusiastically accepted.

Colonel, this is what we are trying to do. This is our goal: an air-minded, air-mobile Army! However, the attainment of our objective depends primarily on the understanding and support of the non-aviator. So you are the best person to answer your last question: "Where is it going to end?"

COMBAT AVIATION BATTALION

Maj. Gen.
DWIGHT E. BEACH

THE 82d Airborne Division, a component of STRAC, is concerned with efficient air movement in order to accomplish its ground mission. For that reason the use of aviation on the nuclear battlefield has been studied with great care.

Movement to the objective area, and particularly within the objective area, has been profoundly affected by nuclear weapons. During an airborne operation involving a parachute assault, the most critical period for the airborne commander begins with the establishment of the airhead. The rapid movement of troops and equipment to their initial objectives and the timely employment of reserves are the keys to the successful seizure and breakout of an airhead. Because of this, the 82d Airborne Division has reexamined the organization and employment of its organic aviation so as to improve its air-mobile capability.

The ROTAD organization provides the airborne division with an aviation company for organic air support. This company is organized to provide surveillance, reconnaissance, medical evacuation, logistical transport, and mobile command posts. In support of troop movements, the organic aviation is capable of lifting small units of patrol size to one reinforced rifle company. This ability to move rapidly is the key to the flexibility required on the nuclear battlefield where troop units are widely dispersed. The tactical doctrine for use of the organic aircraft is considered sound and no change is indicated.

The problems encountered in the employment of divisional aircraft rest with the organization of the aviation company. While we believe the number of aircraft is adequate and the use of these aircraft is sound, certain peculiarities in organization seriously reduce our capability to accomplish the required missions.

These difficulties concern maintenance and centralized control of aviation activities which frequently involve both organic and attached aircraft.

During the past three years, the 82d Airborne Division has attempted to improve the aviation maintenance system. Under ROTAD the aviation company performs first-echelon maintenance. Second-echelon and back-up maintenance are the responsibility of Support Group through its aircraft maintenance detachment. Even though adequate maintenance personnel are available, this split in responsibility causes a wide gap in control between the operational and the maintenance forces. There are two separate command channels, and unity of control of aviation maintenance activities rests at too high a level to be effective. With this in mind, the system was modified to charge the 82d Aviation Company with responsibility for first- and second-echelon maintenance, the Division's Support Group providing back-up. Some improvement was achieved but the basic problem of divided responsibility remained.

Command control is also divided under ROTAD organization. The Division Aviation Officer is responsible for aircraft operations. The 82d Aviation Company falls under his operational control; yet it is organic to the Division Command and Control Battalion for administration and logistics and therefore is under the commander of the Command and Control Battalion. In final analysis, the operational control, the administration, and the maintenance of organic aviation are supervised by three different persons. The Division Commander provides the only unified authority.

Further, the aviation company is large and unwieldy. It consists of men and equipment characteristic of a non-divisional helicopter company, a proposed corps aviation company, and a transportation battalion headquarters detachment. Although it is a large unit, the aviation company's structure is such that it cannot readily accept and control non-divisional attachments.

Analysis of the weaknesses in aviation organization indicated a definite need for a battalion type unit capable of handling all aviation activities in the airborne division. Therefore the 82d Airborne Division has organized the Combat Aviation Battalion organic to a tactical unit.

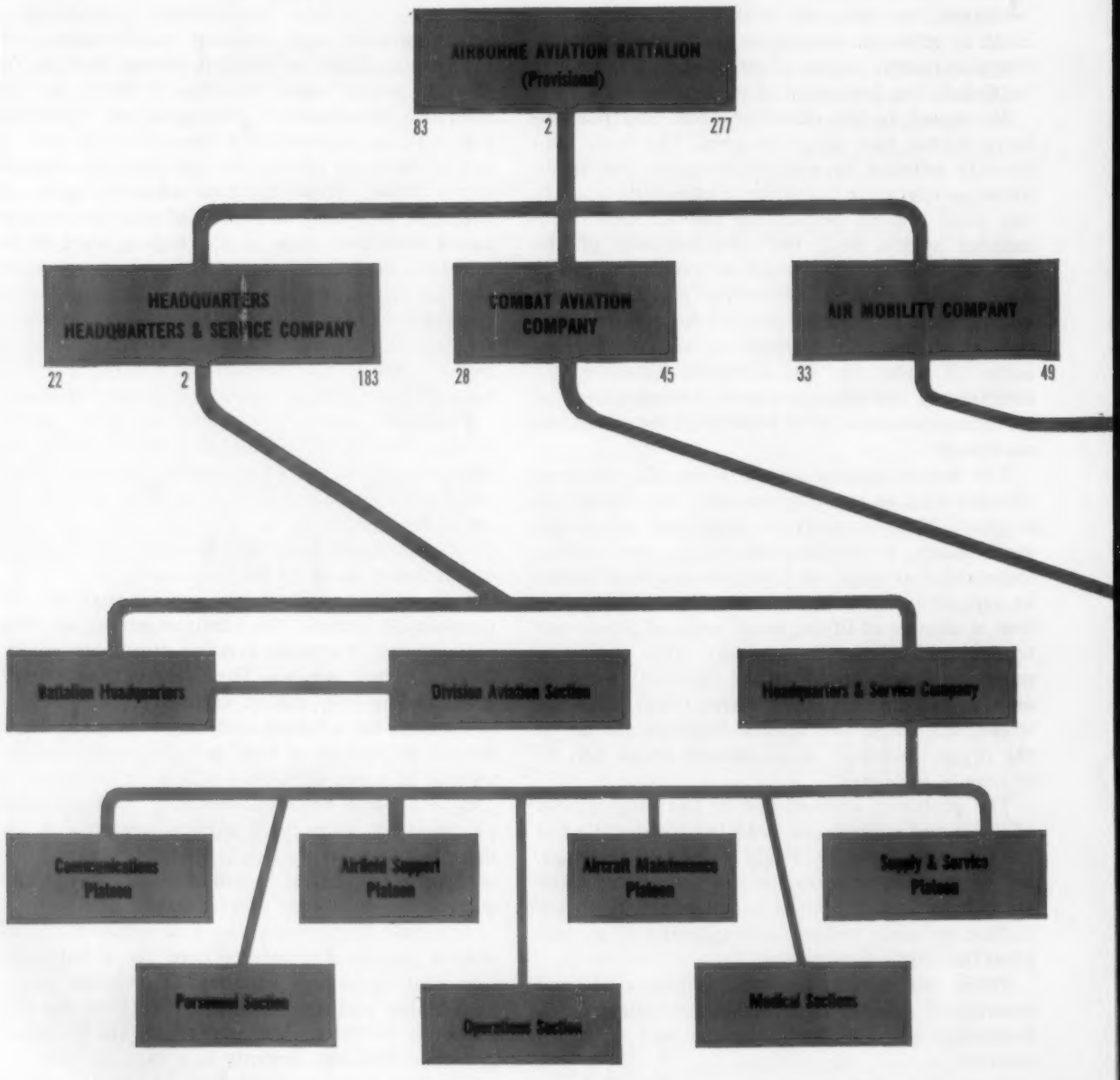
The 82d Aviation Battalion (Airborne) is of necessity a provisional unit until such time as a

TOE can be tested and approved. This unit will be organized and tested within the Division for twelve months. We anticipate that during this time necessary adjustments in personnel and equipment will be made and an effective, permanent TOE developed.

Our new Combat Aviation Battalion was created from existing TOE units. Personnel and equipment previously organic to several units in the Division are now assigned to the provisional battalion. As now organized, the provisional battalion is authorized 247 men, 83 officers, and 2 warrant officers. An augmentation of 30 enlisted men is provided for continuity for those attending aviation schools. At present the battalion is assigned 60 aircraft (including 14 fixed-wing planes and 46 helicopters).

The organization of the Battalion is shown in the charts on these pages. Within the Battalion, there are a headquarters and three companies: Headquarters and Service Company, Combat Aviation Company, and Air Mobility Company.

All second- and third-echelon maintenance, operations, and necessary administrative personnel are carried in the Headquarters and Service Company. The two aviation companies are concerned exclusively with operating the 60 aircraft assigned.



Several new concepts are being tested by the battalion. The battalion commander is also the Division Aviation Officer, thus insuring unified control of operations, administration, and maintenance. As in the engineer and signal battalions, two majors are assigned. One serves as Assistant Aviation Officer at Division headquarters, the other is the Battalion Executive Officer.

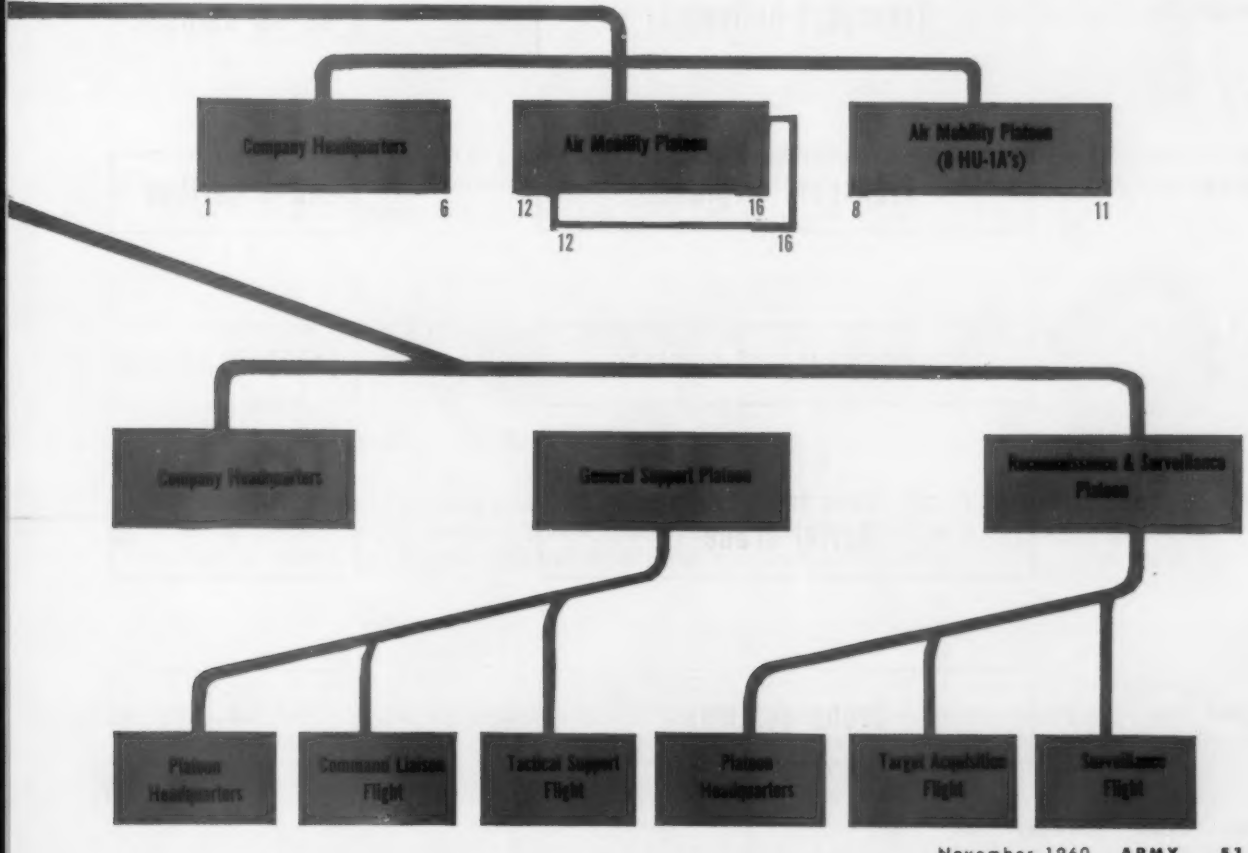
Another important departure from the former organization is the centralization of aircraft maintenance in one platoon under the immediate supervision of the Aircraft Maintenance Officer. This appears contrary to the ROTAD concept that all maintenance functions above first-echelon are performed in Support Group. However, this unit's equipment is peculiar to it. Consequently, no duplications of maintenance functions or increase in maintenance and support personnel resulted from the centralization of these functions and personnel in the provisional aviation battalion. Motor maintenance and mess facilities are also pooled for the companies at battalion level.

The bulk of the administrative load is carried by the battalion S1 and personnel section. The new battalion has its own flight surgeon and two medical aid men. During field training exercises, the battalion flight surgeon also acts as Division Aeromedical Evacuation Officer.

We believe that the battalion will offer these advantages:

- Achieve a higher standard of aviation support by improved coordination, implementation, and supervision of operations and maintenance.
- Clarify the responsibility for all aviation activities within the command.
- Provide more effective utilization of field-grade aviation personnel.
- Provide a more workable organizational structure similar to that of other supporting units (for example, engineer and signal battalions) which will allow flexibility adaptable to the requirements for aviation activity in the Division.
- Provide a suitable staff structure to plan for the control of organic as well as additional Army aviation units which may be attached to the Division.

While we realize that initially a provisional unit may have difficulties adjusting to the functioning of a new organization, we think the 82d Aviation Battalion provides an ideal vehicle for determining a suitable structure for future aviation units organic to the division. In this organization we foresee progress in the continuous program of improvement that will eventually lead to greater efficiency and therefore greater combat effectiveness.



The Army's Coming

Present Air Vehicles	Type	Future replacement
L-19 H-13 H-23	Observation helicopter	HO-?
RL-23 RL-26	Combat surveillance airplane	AO-1 Mohawk
L-20 H-19 H-21 H-34	Utility/tactical transport helicopter	HU-1 Iroquois
H-37	Transport helicopter	HC-1B Chinook
U-1A	Transport airplane	AC-1 Caribou
L-23 L-26	Utility transport airplane	L-23F Seminole
	Aerial crane	?
SD-1	Drone systems	SD-2 SD-4 SD-5

Family of Aircraft

Status of Requirements

- The L-19, H-23, and H-13 observation aircraft will be replaced by a new light turbine-powered helicopter which is just now in the design competition stage. Two designs will be chosen for completion through prototype articles for testing before final selection. Production is scheduled for 1964.

- The Grumman AO-1 Mohawk is being tested now by the Army for the combat surveillance role. The twin-turbine airplane will give the Army an entirely new capability and carry a variety of cameras and electronic sensors which are being tested in the interim RL-23's and RL-26's.

- The Bell HU-1 Iroquois is the Army's new utility/tactical transport helicopter and replaces the L-20, H-19, H-34, and H-21. Later versions will include a model capable of carrying 11 fully equipped troops.

- The Vertol HC-1B Chinook will be a twin-turbine transport helicopter to replace the H-37. This aircraft can lift over three tons and its rear-ramp loading permits the carrying of such items as the Pershing missile system.

- Complementing the VTOL (vertical take off and landing) characteristics of the Chinook is the STOL (short take off and landing) de Havilland AC-1 Caribou. The Caribou can lift 3 tons or 32 troops from an unimproved field less than 1,000 feet in length.

- The Beech L-23F Seminole is an improved off-the-shelf aircraft to meet the utility transport requirement. More versatile than the L-23D and L-26 that it replaces, the L-23F can be quickly converted to carry litters or high priority cargo.

- The Army has had a long standing requirement for an aerial crane to lift 10-12 ton loads for short distances. No procurement is now scheduled for this item, but the Army hopes that state-of-the-art advancements in this field will soon make procurement feasible.

- To supplement the Mohawk, the Army is testing three new drone systems: a short endurance drone, the SD-2, which will replace the SD-1; a medium endurance drone, the SD-4; and a long endurance drone, the SD-5. These recoverable drones can carry cameras and electronic sensors.

The continuing evolution of Sky Cavalry

Lt. Col. JOHN W. OSWALT

A lethal SS-11 guided missile streaks towards a ground target from an Army Iroquois

LOW AND SLOW AND WITH FIRE POWER

THROUGHOUT military history the balance or imbalance between firepower, mobility and logistics has dictated the choice of tactics. When the British first introduced the tank into combat in World War I, few could foresee the tactical potential of this new weapon. To most it was nothing more than a mobile pillbox: a means of getting the war out of the trenches where it had been driven by automatic weapons and massed artillery fires.

The introduction of the tank might be considered as a swing of the pendulum back toward mobility or maneuver over firepower.

Little was done with the tank during World War I and for the next 15 years, although it had its proponents in England, Germany, the United States and other countries. Most military thinkers considered it solely as a mobile supporting weapon for infantry. The idea of mass employment of armor was foreign to most tacticians.

In Germany, future generals like Rommel and Guderian were developing tactics, concepts of employment, refining ideas on organization and developing new requirements for armor. They emphasized maneuver and good radio communications for command control. Out of their theorizing and testing came the panzer formations that dominated Europe in 1939-40.

Mobility had again caught up with firepower and this lesson was not lost on the Allies. From late 1942 onward the Axis was driven to defeat by deep thrusts of armored and motorized columns, airborne assaults and, on the sea, far-reaching sweeps of fast carrier task forces.

Thus World War II was won primarily by superior mobility and logistics. Firepower, exclusive of the atomic bomb which made a rather late appearance, was roughly equal.

The advent of nuclear weapons and the constant threat of their use on the battlefield has swung the pendulum back in favor of firepower. This, plus highly sophisticated air defense systems, has dictated a change in tactics.

Military planners envision the battlefield of tomorrow as characterized by combat that is highly fluid and extended. Battle units will be dispersed and interlocked by fire but not necessarily in contact with one another. Mobile combined-arms units will assume a major role as semi-independent maneuver elements. There will be no distinct forward battle line but rather an area which may include intermingled friendly and enemy maneuvering elements. Engagements frequently will be dispersed and their control decentralized. Enemy tactics of infiltration, guerrilla warfare, stay-behind forces, and air-mobile operations will frequently result in a series of simultaneous actions throughout the depth of the battle positions.

This word picture of the dispersed forward battle area has been drawn in order that you may envision the missions which Army aviation may be called upon to perform in the future. These can be summarized in three sentences:

(1) More battlefield mobility;

(2) Greater capability for aerial combat surveillance and target acquisition;

(3) Rapid and responsive command control.

Our potential enemies will probably outnumber us and are likely to equal us in firepower. Army aviation can contribute to the increased effectiveness of our Army by providing a mobility differential that will make our firepower more effective. It will do this by acquiring more accurate and timely target information, by providing combat surveillance and by making more effective command control possible. In a rapidly changing battle situation, commanders mounted in organic aircraft will be able to extend their command control. Also, armed air-mobile forces can be most effective through surprise and speedy reaction to the combat situation.

In this battle climate many of our forward area aircraft will be appropriately armed, and will have some protection for critical components to include occupants. Air-mobile forces will be able to conduct much of their own direct fire support. Command control helicopters will carry limited weapons for their own self-protection, as will surveillance and reconnaissance aircraft.

To grasp what the Army is doing to increase its combat effectiveness through its aviation, let's look at the evolution of the concept of the armed helicopter mobile task force.

In 1956 General Willard G. Wyman, then Commanding General, USCONARC, was concerned over the need for mobile forces capable of waging a brush-fire war. He directed major headquarters to consider the creation of mobile task forces to perform this function. Subsequently the Aviation School was directed to study the use of armed helicopter task forces. In March 1957, the Army Aviation School activated a unit called the sky cavalry platoon. This was a reconnaissance type force mounted in armed helicopters. This unit had no ground vehicles.

The aerial combat reconnaissance company, as skycav later became known, was intended to provide the Army with an air-mobile, fast-moving, hard-hitting, and flexible means of performing the combat role of cavalry at an accelerated rate on the battlefield of tomorrow. It was and is a cut-and-try unit designed to help develop new ideas on organization, concept of employment and refinement of equipment. For lack of better equipment, weapons and sights developed for Air Force and Navy high-performance fixed-wing aircraft in World War II and Korea were adapted to helicopter use by shade-tree mechanic methods. Helicopters from the current inventory, basically old in design, were used for lack of more reliable aircraft with better performance.

The concept of the armed helicopter mobile task force has existed for more than three years but

Six rockets ready for launching hang from this Iroquois

only recently has it been generally accepted as something more than the mere fitting of weapons to a helicopter. A qualitative military requirement (QMR) for development of universal helicopter weapons systems proposed by the Army Aviation School in December 1957 has recently been revised, and approved by the Department of Army. This will provide a formal basis for preparing military characteristics and for funding for development of new weapons systems by the responsible technical services.

As with any new concept, there has been the usual resistance to change. The question of vulnerability of the helicopter has been raised just as it was in regard to antitank weapons and the tank. The Army Aviation School feels that with nap-of-the-earth type operation, tactics of employment, prior reconnaissance and route planning, and the use of suppressive fire and surprise, the armed helicopter force will be less vulnerable than faster aircraft which break the radar horizon and thus expose themselves to modern air-defense weapons. Certainly a soldier on the battlefield is vulnerable to many weapons, yet all armies still use him. He reduces his vulnerability by nap-of-the-gravel techniques, and base-of-fire tactics.

Assignment to Armor of branch proponency of the concept of the unit type armed helicopter force has done much to aid in its general acceptance. At least now, the concept has a powerful branch for a father; one which can fill spaces and provide other support. The Armor School has changed the name from aerial combat reconnaissance company (ACRC) to aerial reconnaissance and security troop (ARST) but substantially it is the same unit originally proposed and tested by the Army Aviation School.

Tests prove need for ARST

Based on the test of the ARS Troop by the 2d Infantry Division at Fort Stewart, Georgia, in January and February 1960, it appears that additional units of company or troop size will be created. From all indications, the feasibility of the armed helicopter unit being assigned as an organic part of the combat division has been proved. The unit successfully completed a variety of missions under simulated combat conditions. Many such missions were assigned and accomplished in minutes where a surface reconnaissance unit would have taken hours to do the same job. After completing the troop test, the 2d Infantry Division was so satisfied with the operation that it requested the ARST be retained on a permanent basis as part of the division's aviation unit until it is determined where the unit could be utilized most effectively; that is, as a divisional aviation battalion or as a troop of the divisional armored reconnaissance squadron. The division currently

A Sikorsky H-37 Mojave airlifts a missile and launcher

has a provisional aviation battalion which includes the aviation company and the ARST.

Similar tests of the ARST were run in Seventh Army in Germany. The unit operated as part of the 14th Armored Cavalry Regiment. Other agencies, both in the Zone of Interior and overseas, are anxious to obtain standardized weapons kits with which to arm their helicopters.

As early as 1958, tests showed the requirement for an antitank capability in the ACR Company. Although tests of the SS-10 on the H-13 proved the desirability of helicopters armed with antitank guided missiles, adoption of the SS-10 as interim standard for this use was delayed pending completion of tests of the helicopter-borne SS-11. The SS-11 has greater speed and longer range than the SS-10. This permits targets to be attacked from beyond accurate small-arms range and reduces the time the helicopter must remain on station while the copilot-gunner tracks the missile onto target. The longer range did require the aid of optical sighting for tracking and a yaw damper to improve the stability of the HU-1. These difficulties were overcome, as was shown in the 100 per cent hit records at the Armor School Instructors' Conference and later at Project MAN. A news magazine reported that President Eisenhower exclaimed "Holy Cow!" when he saw the Project MAN shoot.

Earlier weapons mountings on the H-13 recon helicopter did not allow for elevation and depression, for charging or safetying the guns in flight. Now we can soft-mount (equip with shock absorbers to absorb recoil) two M-60 machine guns on an H-13. Elevation of 15 degrees and depression of three degrees are accomplished by an electric motor. Charging and safetying are done by a compressed air bottle. The two guns, aluminum mounts, and 1,000 rounds of ammunition weigh

approximately 160 pounds or about 100 pounds less than earlier mountings. It has the added advantages of being able to accept the AMN2 caliber .30, the M37 caliber .30, or the M60 standard NATO 7.62mm machine gun. Also, controls for the guns can be operated by the pilot without removing his hands from his basic flight controls.

The H-34 when used as a weapons ship can mount 24 4.5-inch spin-stabilized rockets and two caliber .50 machine guns. Tests at Fort Rucker have proved that spin-stabilized rockets are more accurate than fin-stabilized rockets when fired from a helicopter. Of course, the fin-stabilized rockets used were originally designed to be fired into the high-speed slipstream of fixed-wing fighters that fly at 300 to 500 knots. Fired from a helicopter such rockets wallow and porpoise until their motors develop sufficient thrust for the fins to become aerodynamically effective in stabilizing them. The 4.5-inch spin-stabilized rocket is a World War II artillery barrage type missile, stocks are low and it is no longer produced. We need a replacement weapon for area-suppressive fire. In Algeria the French found rockets more effective than machine guns largely because of "scare area."

In addition to the use of the armed helicopter in the pure reconnaissance role, we believe larger, completely air-mobile combined-arms teams will eventually be created. These units will include artillery, infantry and technical services support as required.

We also expect that helicopters of the HU-1 type, armed with either antitank guided missiles of the SS-10 or SS-11 type or with rockets, or both, will be integrated into battle groups, combat commands, and other small, mobile, semi-independent combined-arms units to provide highly responsive direct fire support. These armed aircraft will live with the combat unit. Commanders will employ them in direct response to immediate combat requirements. If weather and visibility will permit a 106mm recoilless-rifle gunner to locate and hit a target, this armed aerial vehicle could do the job by combining firepower with mobility. Both pilot and gunner would have immediate and personal knowledge of conditions and would feel the urgency of the situation. The effect of surprise delivery of heavy firepower at the critical place at the proper time places a powerful weapon in the hands of the tactical commander.

The Army is also aiming at improving its combat effectiveness through development of new aircraft and associated equipment for increasing ability for target acquisition and combat surveillance, reconnaissance, command control and maneuver. Certainly in any future war when the firepower and delivery capability of opposing forces are approximately equal, success will likely go to the army that is better able to locate targets.

Evolutionary changes ahead

There has been much debate regarding the desirability of creating a divisional aviation battalion. This has been based upon possible addition of the aerial reconnaissance and security troop, a tactical transport company, and aerial combat surveillance Mohawks and drones to the division aviation unit. In January 1958 the Army Aviation School completed a study recommending consideration and test of a divisional aviation battalion. More recently, the 101st and 82d Airborne Divisions have commenced using provisional aviation battalions *(see page 49)*. It will be interesting to see how these experiments pan out. It does appear that we are moving toward some evolutionary changes in the organization of the current divisional aviation company. The Army is on the threshold of major improvements in mobility, surveillance, command control and flexible-responsive firepower. Spaces, money, and authority will be required if the Army is to achieve the battlefield mobility, surveillance, and target acquisition capability we've all heard so much about. As science and development advance, so must our methods of waging war. The flexibility and increased effectiveness we propose to add to mobility and firepower may provide the differential we need to win.

A 12½-foot, 570-pound Martin Bullpup missile is fired from a Sikorsky H-34. Largest missile ever fired from a copter, it was launched from an altitude of 1,500 feet and landed within inches of its target

A French Army Vertol H-21 sets down on a rocky Algerian hill.

HELICOPTERS IN ALGERIA

NEITHER ROCKS NOR RAIN IMPEDE THE USEFULNESS OF COPTERS AS TRANSPORT AND ATTACK VEHICLES

In the long war against French rebels in Algeria, the French Army has found the helicopter a workhorse of ubiquitous value in operations fought under adverse conditions of terrain and temperature.

After three years of study and observation of helicopter operations in Algeria, Mr. Ren Pierpoint, the European representative of Vertol, reported that the use of H-21 and H-34 helicopters in troop and supply movements, the H-13 in reconnaissance work, and armed French Alouettes and H-21s for fire power paid off handsomely.

Writing in *Army Aviation Magazine,* Maj. Gen. Ernest F. Easterbrook, who commands the Army Aviation Center at Fort Rucker, reported as follows on Mr. Pierpoint's studies:

"The 3-year study Mr. Pierpoint conducted proved the helicopters to be the most feasible machines for suppressing the rebel activity in the terrain and wiping out the isolated rebel band activity.

"He added, however, the helicopters were exposed to nothing larger than caliber .30 firepower. These projectiles had little effect on the helicopter after self-sealing fuel tanks were installed. Before then, fuel tank vulnerability posed a problem and some 'copters went down in flames.

"Projectiles fired through the rotor blades or striking other moving parts did not disable the aircraft to the extent that they could not return to home base. On rotor blade hits, a piece of tape was placed over the hole. When bullets went through the metal 'skin' of the machine, they tumbled and lost penetrating power and failed to affect the moving parts.

"One significant point brought out by Pierpoint is the fact that

Loaded belly-mounted bomb rack on H-21

pilots discarded contour flying in favor of higher altitudes. This was done because ground fire posed little problem and the enemy lacked tracking devices such as radar.

"The effort exerted by approximately 100 machines can be appreciated in the light of some 45,000 hours of flight time over desert and mountainous terrain. This flight time represents operational support missions of both a tactical and logistical nature. Pierpoint said the Algerian revolt proved that organic aviation pays off, but that it works more effectively when the troops are experienced in helicopter transport.

"In his opinion, an efficient operation requires that the soldiers must:

"Be experienced so they can be landed under fire and be ready to kill upon debarking.

"Unload in a hurry, because the 'copter is most vulnerable on the ground and usually lands the troops close to the enemy to expedite the engagement.

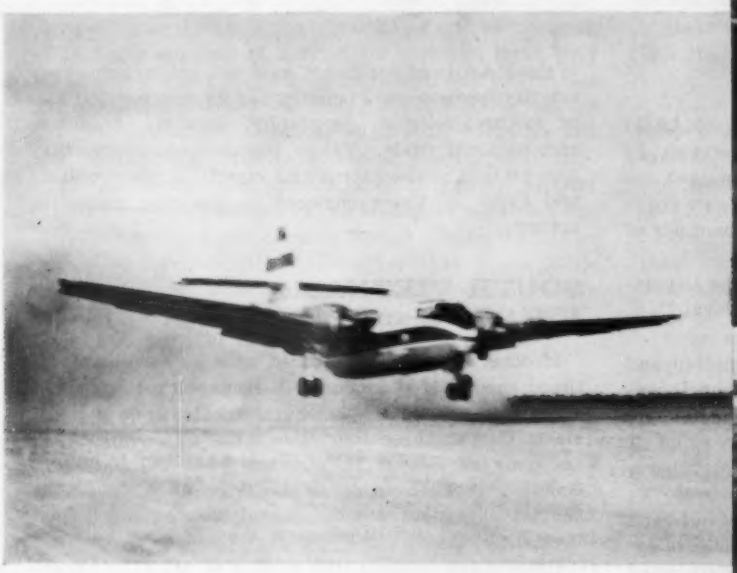
"Seek cover rapidly out of the way of other 'copters landing troops in single file.

"Set up firepower as soon as possible to suppress the enemy.

"Establish their role before the landing, because orders are difficult to receive and give due to the noise.

"Inexperienced soldiers, Pierpoint said, either freeze or bunch up and act as if they're in a trance."

IN PLOWED FIELDS OR DESERT SAND THE CARIBOU IS STILL STOL



At Mansour and Bahrein Island in the Persian Gulf, the Caribou is seen – in the photo at left centre – taking off from unadulterated desert sand. Photo, lower right, shows depth of furrows ploughed in sand by aircraft's nose wheel gear.

A supreme test of STOL ability was staged at Fort Rucker, Alabama on a mud strip soaked with water for hours, then ploughed to a depth of 14". Photo – upper right – shows mud compacted ahead of wheels. Right centre, deep ruts etched in mud by Caribou take-offs and landings.

The Caribou

Designed and Built by

DE HAVILLAND AIRCRAFT OF CANADA

DOWNSVIEW

WASHINGTON REPRESENTATIVE: J. E. McDONALD
319 TOWER BUILDING, 14TH & K STS., N. W.

THE FAR EAST MAAGs:
Good Investment in Security

CHARLES S. STEVENSON

THE Military Assistance Advisory Group (MAAG) program appears to be the best investment by U. S. taxpayers in our efforts to deter Communist aggression. That is the only conclusion you can reach after looking into this activity in several countries of Southeast Asia.

MAAG programs, while administered by the Department of Defense, are implemented through local U. S. commanders in more than 40 countries.

For its work each MAAG prepares assumption and guide lines that cover training, budget, personnel, construction, and other things over which control is required. A country team (U. S. Ambassador, Chief of MAAG, and local heads of native agencies) then reviews proposals, and action starts after approval.

There is a stated objective for each nation, but each mission provides, generally speaking, for the development, training, effectiveness, and combat-readiness of its armed forces. U. S. skills plan, advise, analyze, recommend, direct and monitor agreed projects. Most of these, but not all, are in the military field.

MAAG officers make special efforts to create, maintain and improve morale not only with their counterparts and among one another, but with the citizens. In some countries MAAG personnel wear civilian clothes most of the time.

No Americans are permanently assigned to specific national units, because MAAG has not enough people. As a result, MAAG personnel, particularly those of Army elements, constantly move about to maneuver and field exercise areas, warehouses, headquarters, service depots, ammunition storage sites, weapons locations, barracks, hospitals—every place the country's servicemen are found.

The U. S. Army is the principal contributor to the execution of projects, some of which are of a Navy or Air Force nature. This is because the Army, under the Military Assistance Program (MAP), is, for the most part, charged with the top objective: development of modern, capable ground forces. This sounds relatively simple, but in operation it can become highly complex.

More than 5,000 U. S. officers and men are engaged in this world-wide effort. By virtue of their efforts, together with the equipment, weapons and supplies we provide, the Free World may count on some 200 combat divisions—approximately 80 per cent of its ground forces strength.

What we shall examine of the Army's participation in the MAAGs of Southeast Asia will not include every activity, because each country has its own peculiarities of culture, religion, geography, economy, tradition, and national pride. Taken together, however, they give an idea of the extent and variety of the problems and tasks of those engaged in assuring collective security.

SOUTH VIETNAM: 150,000-Man Army

If other MAAGs have faced odds as formidable as those encountered in South Vietnam, it's a good bet none have exceeded the harassments and physical risks. Despite these difficulties, since 1 December 1958 an army of almost 150,000 has been undergoing a complete reorganization in the interests of increased combat efficiency—a monumental task by any measurement.

Despite the hazards, the results of MAAG's efforts here are most gratifying. The army of South Vietnam has demonstrated that it can, when properly employed, more than match guerrilla forces to the extent that it inflicts 10 casualties for every one suffered. Compared with other armies of Southeast Asia, it is considered to have a relatively high degree of combat effectiveness. More important, it has brought to the nation order, stability and confidence.

The reorganization, in which MAAG played an important role, changed two types of divisions—one of 6,000, the other of 8,000, neither strong, properly trained, nor organized for combat—to one type of 10,450 with three regiments. This has resulted in a uniform TOE division, greater combat capability, and a better balance between combat and support elements.

MAAG officers act as advisers in battalions, regiments and divisions. Theirs is not the job of straightening a soldier's rifle on the range or perhaps helping adjust a sight. As with all other MAAG personnel, they are expected to point out such deficiencies to the host country's officers and noncommissioned officers, who in their own manner and in their own language impart the person-to-person correction the solider needs.

Presently there are some 19 MAAG detachments spread from the 17th parallel in the north to the southernmost swamplands in the south. Some units have only three or four men, others up to 30. Training areas include extremes of plateaus, jungles, and delta swamps.

Here, probably more than in any country of Southeast Asia, the personal relationship among officers plays a vital part in MAAG's success. The Vietnamese officer, usually with some inadequate training in a colonial army, treasures his new status and has strong convictions about his own independence. Americans are aware of this and try to be governed accordingly when unexplainable delays and foul-ups occur. Having no command authority (as with all other MAAGs except that in South Korea), they must influence through their personality as well as their skills.

Because most senior Navy officers were French-trained, they retain French traditions and procedures. The Navy consists of a river force, a sea force, and a marine corps group. It operates craft up to the size of modern minesweepers. The Air Force too preserves the French influence because up to 1957 it was trained by the French. MAAG now has this responsibility. The Air Force can provide limited fighter support during reconnaissance and can transport paratroopers.

Willing, eager and capable though Vietnam's troops are, there seems little to suggest that if the Reds really start south in force, they would encounter more than a delay in reaching the southern tip of this gallant and friendly country.

JAPAN: 230,000 in "Self Defense Forces"

MAAG in Japan works under a handicap evident to only a minor degree, if at all, in other countries receiving U. S. aid: that is the national antipathy toward rearmament. Apparently the Japanese meant it when they wrote into their 1947 Constitution that "land, sea and air forces, as well as other war potentials, will never be maintained."

Obviously the Japanese are guiding their destiny by head-in-the-sand philosophy. Such an attitude now provides little more than plans only to look after themselves and the thriving economy they are enjoying. It is said this stems from a fear that the militarists again may rise to power and that rearmament would involve the nation in another war.

The activation of the Ground, Maritime, and Air Self Defense Forces has resulted only from the interpretation by a few realists that the clause was not meant to preclude Japan from defending herself against aggression. (When you speak of Japanese soldiers, you never say Army; you say Ground Self Defense Forces.)

The Army element of MAAG Japan devotes its time and efforts to developing and improving five army organizations of six infantry divisions, four combined brigades, and an airborne brigade. Divisions are patterned after the U. S. triangular unit of World War II.

MAAG is unusually effective in technical and logistical matters as it translates its experience to Japanese minds. For example, the Japanese are developing ways of locally manufacturing articles now wearing out. These include the 106mm self-propelled multiple recoilless rifle, an over-snow carrier, an armored personnel carrier, and an antitank missile. They have developed a medium tank suited to Japan's terrain. The Navy has built 53 of its 91 warships, and the Air Force soon is expected to be turning out its own F-104 jet interceptors.

The Ground Self Defense Force of approximately 170,000 troops is trained in a system of 12 service schools, an aviation school, an OCS, a National Defense College, and a Defense Academy. Even in the face of a tight budget, school staffs and faculties are maintained at full strength. The GSDF wins friends through disaster relief and constructing roads, bridges, and minor public works.

The Maritime Self Defense Force (23,000 men) has 91 vessels that are mostly antisubmarine ships, patrol boats, and minesweepers. Unit training of the surface fleet moves along well, as does that of the naval air arm.

The Air Self Defense Force of 1,300 planes and some 37,000 airmen is only six years old. The job of training and building logistical bases from which combat units operate moves along with the same speed as the country's economy, and is almost completed. Currently, the ASDF, among other units, has three combat-ready jet-fighter squadrons. These will be augmented as more pilots and ground crews are trained.

Even with continued U. S. support, it appears that the Japanese defense forces can hope for only a limited chance of being of much help in maintaining peace and stability in a region troubled by Communist agitation. To support this defense posture, the United States spends about a half billion dollars a year.

THE PHILIPPINES: 31,000 Spirited and Eager

"It can be safely said that the Philippines can be counted on to be a great ally for the Free World," a high-ranking member of JUSMAG (Joint U. S. Military Advisory Group, as the agency is called here) told me. "This doesn't mean we don't have a few problems. For example, there's the emotional reaction of the Filipino. He is not hesitant in asking for things, and when not granted, he assumes an air of injury, saying, in effect: 'Here we are, the children of the United States, and our own Mother won't give us this.' He is a realist, however, and makes full use of the assistance the United States is giving him."

Several projects in the Philippines serve unusually well to show how certain aspects of the program are of both military and economic benefit.

The improvement of the nation's airbases, while basically for the Philippine Air Force, means better bases for civilian planes and, if needed, for the U. S. Army and Air Force. An airfield being built on the island of Mactau, where Magellan was killed by natives in 1521, will serve as an alternate to the overcrowded Manila International Airport. The conversion of certain carabao trails into roads fit for vehicular use to inland settlements obviously offers a dual advantage. In these and similar projects, the manual labor is done by Filipinos, assisted by American advice and machinery.

The strength of the Philippine Army is about 21,500, mostly infantry. Headquarters is at Fort Mc-

Kinley, where new barracks, classrooms, hospital, maintenance shops, and training area were made possible by U. S. help. Both Filipino and U. S. officers are proud of the school, which has courses in combined arms, intelligence, administration, and similar subjects. This school also accepts students from South Vietnam, Laos, and the border police of Thailand.

Recently the U. S. Navy element of JUSMAG helped the 4,250-man Navy streamline its accounting and warehousing procedures. The Air Force element, with 6,200 Filipino airmen to train, made a great showing in also training civilians and service technicians in maintenance and repair of new types of aircraft.

The spirit, confidence and courage of the Filipinos are evidenced by the fact that theirs was the first government in Southeast Asia to declare its readiness to send troops to Laos if SEATO called for them. Two years ago it was quick to offer full support to the United States in the Taiwan crisis.

Farther removed, but only some 400 miles at that, from the cold war front in Southeast Asia, the Philippine forces are efficient and eager, though small. If spirit is important, the Philippines lend strength indeed to the Free World.

THAILAND: 134,000 in scattered groups

The armed forces of Thailand appear to have improved as much as any in Southeast Asia since the program started in 1950. This does not necessarily mean that Thailand's forces are better than those of other nations, or that they have more and better equipment. It's just that from a modern combat viewpoint, the Army a decade ago was very ineffectual.

For example, while there were varying supplies of ammunition, little was available to sustain even a mite of a training program. Sources of supply for ammunition and spare parts for equipment (a varied collection from Japan and England) had dried up after World War II. Today, not only is the supply of expendable ammunition adequate, but as a result of acquiring U. S. machinery and technical assistance, Thailand makes its own .30 and .50 ammunition—at least enough for training. In addition, a newly built phosphate-processing plant can refinish all small arms—an important factor in maintenance in a humid, hot-wet country. U. S. Army personnel supplied planning, financing, and technical help.

To give their best attention to defense problems, about a third of JUSMAG's people are scattered among what are called "up-country detachments." In these detachments the techniques of the infantry-armor-artillery team, and maintenance, medical and support operations are passed over to the Thais commensurate with the degree to which they can absorb them and the limit of physical endurance of the U. S. instructor. The rest of JUSMAG's force is assigned to service elements at headquarters.

JUSMAG's field force is rather thinly spread out. A day's schedule will find them counseling on a multiplicity of projects throughout the 92,000-man Thai Army. One officer will be advising on rifle practice at a newly built small-arms range; another, perspiring in the hot sun, will be counseling on tactical training of a company or battalion. An Army aviator and a noncommissioned technician will be carefully observing as increasing numbers of Thai pilots and mechanics learn to fly and maintain the 38 L-19s and 4 L-20s that have been delivered. New equipment recently received include Japanese-made 2½-ton trucks.

Procurement practices, transportation, warehousing, inventory control, and related logistical details of the Royal Thai Army are showing the imprint of American efficiency and control methods.

The five infantry divisions are organized on the triangular structure, because the nature of the terrain and the type of combat expected suggest this as the most efficient. Three divisions are American-supported with modern weapons and tactical training; the other two retain the former organization. Troops are stationed in areas where they can defend against probable avenues of attack.

The Royal Navy of 20,000, proud of its 14 former U. S. ships, devotes its time to submarine, anti-submarine and patrol duty. A naval station at Sattahip has facilities for dredging, constructing piers and sea walls, and developing and supplying distribution ships. Thailand's Marine Corps of 4,000 is one of the few in Southeast Asia.

The 22,000 men in the Air Force use jets, piston aircraft, and helicopters.

Thailand, currently so harassed by shortages in certain equipment that it uses mock-ups of wood, string and metal for training, would more than hold its own against an equal force of south-bound Communists. It would be unfair, however to expect much more from these loyal, high-minded people.

SOUTH KOREA: Unlike the other MAAGs

In South Korea the military aid program differs from that in any other country: it is directed by the U. S. commander in chief in the Far East, who also heads the United Nations Command. In other words, it is strictly an American operation, while in other nations the project is jointly operated by the U. S. and the host government.

When the Japanese left Korea in 1945, a native constabulary was formed for the nation's internal security, with American officers in an advisory capacity. Three years later, when Korea became a republic and got its own army, the U. S. assisted with what was called a Provisional Military Advisory Group. Since 1 July 1949 this mission has been called Korean Military Advisory Group (KMAG).

Unlike MAAGs in other nations which assisted existing forces, KMAG had the job of building an army from scratch. The process was highly complicated, to put it mildly, by the Communist invasion of South Korea on 25 June 1950. To American officers, what had been an assignment in organization became a fight for life. Many found themselves fighting trained North Korean Communists instead of training inexperienced South Koreans. Today,

KMAG has 12 detachments distributed among 20 active and 12 reserve divisions.

Like Thailand, South Korea makes its own .30 and .50 ammunition, assisted by American advice and skills. Technical schools have been established. What is being done in Korea duplicates training undergone in the United States and the nations it aids.

KMAG was responsible for transferring responsibility for logistics from a separate South Korean Army to a Chief of Staff for Logistics. Distribution of POL, ammunition, food and other classes of supply experienced a similar change, to provide centralized control. Reduction of pilferage and misuse of equipment and supplies were drastically reduced through suggestions by KMAG advisors. For example, treads on military tires different from those on commercial tires, and distinctive markings on military clothing and equipment.

As in other nations, the Army element of KMAG is engaged in a vast program of rehabilitation. Engineers are directing the reconstruction of power plants and dams, designing modern irrigation methods, improving public utilities, inaugurating health facilities, paving highways, erecting bridges, and aiding in other areas of civilian needs.

South Korea's navy is a modest one of some 70 vessels. It devotes much of its time to protecting South Korea's important fisheries. The Air Force is also small, with an estimated 200 planes. Neither of these forces could be expected to provide much help in either offensive or defensive operations.

Compared with other nations, the total value of military aid by the United States to South Korea stands among the highest. Over a ten-year period, South Korea stood fifth in value of money received; in 1959 it was second, getting more than $205 million.

The South Korean Army looks good. KMAG personnel are confident that if the South Korean Army and the U. S. divisions there can get proper air support, together they can hold their positions.

TAIWAN:
A high state of preparedness

The armed forces on Taiwan, which last year received the most U. S. military aid money, appear to be the best-equipped and best-trained in Southeast Asia. By that I mean it looks like a good army, not good by comparison.

Here the MAAG, one of our largest, has brought the Chinese Nationalist forces to this state of readiness from an even more distressing condition than that which faced the South Koreans after the Panmunjom armistice. When MAAG began its work on Taiwan, the Chinese Nationalist forces were actually the remnants of a defeated army. Observers have stated that the weapons brought from the mainland were probably the most diverse collection ever assembled in one army. Today, with a slight nod to the will of Generalissimo Chiang Kai-shek, but with many to MAAG and the generosity of the U. S., the armed forces represent a great and able deterrent to Communist aggression.

The Army element of MAAG is in process of reorganizing the Taiwan garrison into 11,000-man triangular divisions. There are to be 21 infantry divisions, two armored divisions, and special units. Estimated total is 400,000. Generally speaking, about half of these divisions have been organized, and their training and equipment brought to the state to which MAAG aspires. The training of the rest probably will proceed faster with the arrival of newer weapons.

Army advisory teams are spread over Taiwan and the offshore islands, in units from field army down to the lowest. On Taiwan, MAAG can be found in units that have CONUS counterparts: Nike-Hercules batteries, amphibious units, tank battalions, automotive repair shops, rifle ranges, PIO officers. Some have declared the training curriculum a combination of our service schools, the Pentagon, and the Louisiana maneuvers.

One accomplishment by MAAG was that of bringing Chinese Nationalist officers and enlisted men to combat readiness with Nike-Hercules weapons. This was done in eight months, compared to an average of 18 months elsewhere.

In the Kinman Command (Kinman is Mandarin Chinese for Quemoy), embracing the islands of Quemoy, Matsu and the Pescadores, MAAG advisors adapt themselves to the austerity and hazards of these troubled areas. They confer in tunnels dug into the brown hills, observe amphibious maneuvers on the narrow beaches, leap into bomb shelters, participate in island alert exercises, and crawl over 8-inch and 10-inch artillery pieces which match those of the Communists only five miles away.

In the center of Quemoy, MAAG officers can point to a Chinese psychological warfare unit which, when the wind is right, releases leaflets ranging from colored cartoons to pin-ups and the like to their mainland enemies.

MAAG here stresses the importance of good relations between officers of the two countries. All American officers are required to undergo a 40-hour course in Mandarin Chinese. There is an "open door" policy during duty hours and the social activities frequently include meals.

Taiwan's 170,000-man Navy is primarily a patrol and amphibious force, with destroyers the largest of its estimated 150 ships. It has some submarines, and its amphibious force has been declared by some officials as "powerful."

The Air Force, whose basic mission is defense, includes 500 planes, about half of which are jet fighters. Strength is about 110,000 airmen.

To summarize, Quemoy appears sufficiently strong to deter Communist invasion, unless the Chinese Reds resort to nuclear weapons. As for Communist defense of their mainland, it had better be even stronger than the Peiping propaganda mill says it is. The Chinese Nationalist Army looks good enough to handle all the Reds can throw at it.

if he doesn't

Capt. RICHARD L. KIRK

THE air was heavy in the nuclear weapons van. Officers clustered about a variety of maps, and the tension could almost be felt.

Aggressor, shown in red on the situation map, had been maneuvered exactly the way the General had planned. Finally, after days of limited advance and limited withdrawal, the big payoff had come.

"This is the place!" The General's finger pointed. "Right here, Captain Mushroom, is where I want the burst. How long will it take?"

The Nuclear Weapons Employment Officer (NWEO) was emphatic: "We can put one in there, sir, in about 20 minutes."

"That's got it! Any later than that won't cut the mustard. Intelligence says Aggressor's massing this minute to get on the road. I want a high assurance of no significant fallout and at least moderate damage to men and vehicles within this circle. Any questions?"

"None, sir." Captain Mushroom was already at the phone.

"Very well, take care of it." The General paused for a moment in the doorway. "Captain, don't forget to notify the troops."

Now the massive and delicate machinery of a division in battle or on maneuvers goes into play. The combined brains and skills of 12,000 men are geared to a single goal: the General's desire to drop a nuclear burst upon Aggressor. Delivery will be by Honest John.

If this were a textbook example, we would assume that the strike burst on or over the intended area and that the effect upon the enemy enabled us to advance and hold our positions. But that didn't happen.

Did they all get the word?

What went wrong? Why were we not able to seize an immediate advantage of the burst? We knew the danger areas, where we had to avoid the radiation hazard. All this had been worked out by the NWEO and put out to the troops. Hadn't Captain Mushroom personally called each battle group? Battle groups must have had enough time to tell everyone. Or had they? For that matter, *could* they? Could battle groups get the word to companies, companies to platoons, platoons to squads, squads to the last soldier? Did every man in that division, every soldier who occupied a vital spot, get the word? To anyone familiar with communications and the liaison within the current division and its battle groups, the answer is obviously No.

What went wrong? Not in the command tent, nor with the company commander. Not where communications means were monitored and working. But what happened, say, to PFC Wrench, driver of the maintenance truck for Headquarters Company? At the time of the burst he is headed for Bravo Company. Being a good driver, Wrench keeps his eyes on the road, but unfortunately for his 20-20 vision, at the instant of the burst his truck is on an uphill slope at such an angle that the flash, although at a safe distance from him, is directly in his line of vision. There is a momentary white light of high intensity, not severe enough to blind Wrench but bright enough to dazzle him. It was as though a flash bulb burst in his face. Fortunately, his reflexes kept the truck on the road.

All over the division this same scene with other actors has been repeated hundreds of times. Some men were in vehicles, some out, some merely standing around, gun crews firing a mission. Wiremen atop poles or moving along roads, vehicle recovery crews, ordnance men, mechanics, bakers, Red Cross workers—practically every echelon of command and operations has been exposed to the dazzling light with its simultaneous psychological impact and momentary blindness. Had the burst been close enough these men may be considered within the exposed and unwarned area, something the division commander may not have included in his calculations of risk.

Most of these soldiers will return immediately to duty, some may require a little longer. But whatever the impact, the division is not the same as it was when the General planned his post-strike move. He is hampered now by these hun-

get the word

dreds of minor obstacles. Wrench's truck has stopped and he is confused by his proximity to the blast. Communications are momentarily disrupted, a dozer driver lost control and went over a bank, a cook scalded himself. Each small incident detracted from the picture the division commander had of his unit prior to burst time. Result? Aggressor was given additional time to marshal his forces, send damage control teams forward, organize transportation, and move to where he can reorganize and regroup. The conflict goes on and casualties continue to mount on both sides.

This is no exaggeration

You think this example unusual, an exaggeration? Not in any sense. During Exercise Dry Hills, held at Yakima Firing Center in May 1959, just such incidents were tested and evaluated by a group of CONARC evaluators. They ranged far and wide during the exercise, noting arrival times of the various warning messages that let the troops know when a strike was going off. Around the clock they checked to see if every soldier in every squad of the test battle group got the word in time to take protective measures before and after the strike. Their final report included some amazing facts and figures that pointed out the tremendous difficulties facing the person or the headquarters or the agency charged with notifying the division of a friendly nuclear strike.

Let us examine the nine objectives of the test. While the over-all purpose was to determine doctrine and methods for nuclear flash warning systems, specific objectives were divided into these categories:

- Determine the best method, or methods, of warning friendly troops of the intended employment of nuclear weapons in our own offensive, defensive, and retrograde actions.
- Determine the time required, in each situation, to disseminate this warning to all soldiers of the battle group.
- Determine the adequacy of current signal equipment to implement the required warning.
- Determine the effectiveness of current visual signal devices, if used as part of the warning system.
- Determine new or additional equipment required to implement an adequate warning system.
- Determine the specific information to be transmitted in each situation and by each lower headquarters.
- Determine if the warning time required conforms to the decision to fire and delivery time.
- Determine if additional time is required to warn higher and neighboring units of intended employment of weapons allocated to battle groups.
- Determine the enemy's ability to detect and react to our various methods of warning, and to the resulting actions of our troops.

With the 22d Battle Group organized under the series D concept during the test, the problems of determining these objectives were pre-tested prior to actually moving out on the maneuver. Time and again, troops heard the code words HOT SHOT from the evaluators or over communications equipment. All the details of what to include in the test questionnaires were figured out by groups of evaluators, and the final sheets were assembled. No means of compilation was overlooked, including the use of IBM machines to tabulate results.

What's the best method of warning?

Taking the objectives as single items, first and perhaps most important is that dealing with the best method or methods of warning friendly troops. In studying this objective, each test message was indexed by two pertinent items. First was the type of operation in progress; second, whether or not the last unit or the last soldier in the chain had been notified in sufficient time to take protective measures. This time element was considered to be a minimum of two minutes prior to the burst. It was based on a local decision that two minutes would enable an individual soldier to get under some kind of cover.

Several methods were tried. These consisted of variations in the use of communications, addition of airborne signals such as helicopters with

smoke or noise-producing devices, the zero beat on radios, and several others. There was also a helicopter whose siren would alert radio and switchboard operators prior to a net and conference call.

Rather than adopt a clearly defined method for warning all personnel, which began to look impossible, the study did arrive at some conclusions as to who should be warned, what the message should say, and when and how it should be disseminated. It was determined that the warning message to the troops in all tactical situations should be transmitted simultaneously, by all available means. This much was made clear by the test: not *all* the troops got the word *all* of the time, regardless of the system tested. Therefore, the efficiency or the aptness of any system was still, even at the end of the test, shrouded in considerable fog.

The problem of determining the time required to get the warning to all soldiers of the battle group in each situation was essentially a simple one. Again basing adequate notification upon receiving the message two minutes before burst, a simple decision was made to adopt, through elimination, a period that most quickly alerted all units within the test battle group. This demonstrated that the tactical situation had little or no effect upon receipt of the message. Communications seemed to work equally well in any event. However, it was found that a test message which, in one instance, took 13 minutes to get to the smallest unit in the battle group, actually established what might be set as a minimum period. It must be pointed out, though, that this was only *one* message that even in this instance did not alert *all* personnel. The best that might be said for it was that the message did make its prearranged rounds, certainly as far as radio or switchboard operators. What happened to it after reaching the unit commander depended again upon several factors.

Adequacy of signal equipment

In determining the adequacy of current signal equipment to effect the required warning, the evaluators faced the problem of trying to decide just what was "adequate." Certainly exhaustive field-testing of the equipment by experts undoubtedly determined a particular radio as adequate in the technical sense. However, when the human element enters, the situation changes considerably. It was discovered that only 68 per cent of the warning messages transmitted over the command net were actually received at company and reconnaissance platoon. Even more startling, only 28 per cent of the messages transmitted over the administrative net were received. This deficiency was attributed to several factors. The terrain at Yakima Firing Center generally is hilly, and the line-of-sight characteristic of FM radio ran into some trouble. The range of the AN/PRC-10 in the administrative net was insufficient, particularly when, under the new concept, units were dispersed on the nuclear battlefield.

Finally, and perhaps most significant, it was found that battle group personnel were divided into three general categories. Men who work at a duty station within the battle group's area normally have access to communications facilities. There are others whose mission requires them to move frequently all about the battle group's zone of action, and who may or may not have access to communications facilities. These, of course, include maintenance men, truck drivers, the ration breakdown, and wire crews. There is a third group whose mission takes them out of the zone of action, and who may or may not have access to communications facilities. These are the people who periodically go back to division or make contact with flanking units: ordnance teams, liaison personnel—men who may be caught on the road without a radio.

Of course, it is easy to notify the first group. They are near their own radios or near someone with a radio or telephone. They get the word, but the other two groups, in the overwhelming majority of the time, do not. Or so the Yakima tests demonstrated.

When it came to determining the adequacy of current communications means, the evaluators concluded that, except for the range of the AN/PRC-10, the equipment authorized by the D series was adequate to warn only that group which worked at a fixed duty station.

While radios were being checked, attention was given to wire nets. During Dry Hills, telephone service was in about 75 per cent of the time. Whenever a flash warning was distributed by every available means, the telephones worked reasonably well. This is not to say they saved the day, because most assuredly they did not, though they filled some gaps. Primary attention was given to radio under the concept that the dispersed, mobile, self-sufficient force on the nuclear battlefield, may not always be able to lay lines. Visual devices, smoke grenades, flares, smokepots, and the like, were also checked and generally found inadequate as means of atomic flash warning. Their use, however, as attention-getting devices, was urged in further study of this tricky problem.

Keep the message simple

An IBM tabulation was made of all the elements in all the messages through all units, with a view to determining those parts which had been weeded out at local command posts. This tabulation revealed that flash warning messages should include only those data vital to the recipient.

Who determines what elements of the message are vital? If we crowd the air with data about the planned ground zero (PGZ), the yield, the height of burst, the range for delivery, the delivery system, the safety distance required, the degree of risk, and whatever else our NWEO comes up with, who will understand them? The more information we include the more chance of garbling the whole works. Keep the message simple, concluded this portion of the study. Let the commander determine which units should get the coordinates or the general direction of PGZ. Basically, the important data transmitted were the designator or code word for a friendly nuclear strike, the date and time group, and the protection period necessary. It is quite possible that even the final item, the protection period, could be eliminated when the unit, whether division or battle group, establishes a definite SOP. The problem of what to transmit, however, finally may be left as a sort of ground rule set up by the unit concerned, depending on the proximity of subordinate units, their tactical situation, the present and the projected mission of the unit and, quite possibly, their equipment.

Intangibles in allotting time

In determining whether or not the warning time required conformed to the decision to fire and the delivery time, it became progressively difficult, because of the classified nature of delivery times, to project a hypothetical situation in such a manner that a real answer could be obtained. If we return to the period of 13 minutes for notification within the battle group, it seems obvious that when delivery time and decision to fire exceed 15 minutes (that is, the notification period of 13 minutes plus the two minutes required for protective measures), the difficulty of notifying the troops through radio operators can be overcome. This is true only when the weapon used is allocated to the battle group.

Study also disclosed that notification time from division to battle group took 16 minutes. This gives a total of 31 minutes through division. With delivery times constantly fluctuating, it is essential that thorough knowledge of the warning time be allowed the commander concerned. Without it he cannot notify even that portion of his command which has some means of communication. Moreover, such elements as prior computation of effects by the NWEO at division headquarters will shorten the time required for notification, and this will play a part in correlating the periods. If the commander expects to follow up the tremendous impact of the nuclear blast, new warning systems must constantly be studied in order to shorten the time required. Finally, if the time required does not conform, the commander may be forced to fire a nuclear burst without notifying certain elements, hoping that the results will justify his action. Here again he must exercise command decision and accept his calculated risk.

When it becomes necessary to warn neighboring or higher units, the period required for notifying them must be considered as a single factor. In these instances, the commander must know how long it takes to gain contact with other units, and he must add this to the time required to notify his own. Moreover, he must allow sufficient time for his neighbors to coordinate for a move he has already prepared for. When the period for internal notification is 15 minutes and that for communicating with neighboring units is four minutes, he must allot at least 19 minutes from the decision to fire.

Going back to the problem of delivery time, should this factor be less, the commander must, unless the tactical situation dictates otherwise, allow the 19 minutes required for notifying internal and adjacent units or higher headquarters, or both. Whether or not he believes the adjacent or higher unit capable of notifying their own troops as quickly as he can his own, will affect the period the commander may allot for warning. All these intangibles must be considered.

Before leaving the impression that a lateral or vertical transmission is simple, I should point out that a warning message received by the test battle group from an adjacent battle group actually took 15 minutes, rather than the four in the hypothetical situation. This was based on the period from the time the battle group commander decided to fire, to actual receipt of the message by the test battle group.

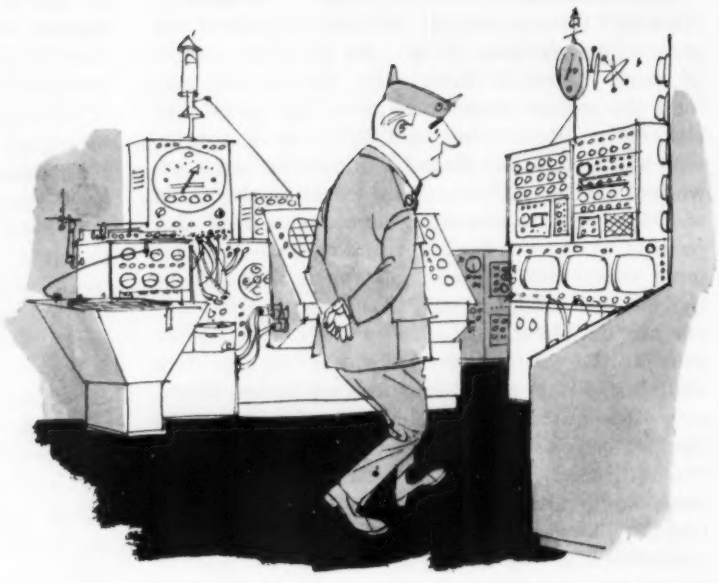
Safeguarding security

After a study of Aggressor's actions, it was decided that his time for evasive measures, based upon visual observation of protective measures taken by U. S. Force, was so short as to be insignificant. His radio intercept, however, was a different matter. Since Aggressor can intercept, it is logical to assume that, should he read a message in the clear indicating our pending nuclear strike, surely he will take some defensive measures. In order to preclude this, or at least to render it difficult, the valuator group recommended that, time permitting, the entire flash warning message be encoded or scrambled; that, at a minimum, in all instances the time of burst and the PGZ be encoded and that the wording be varied frequently.

In reviewing the pertinent aspects of this study, we see that the commander must drastically revise his concept of the use of nuclear strikes. To

(Continued on page 80)

SHAPING UP THE SPECIALISTS



An airborne type takes on the high IQs.

Major JOHN M. COLLINS

A RAW wind sliced through the autumn twilight at Dix. "A touch of things to come," mused the Major glumly. In an hour he'd be on his way to maybe professional limbo in the arctic. First light at his new station in the Far North was two months away. When his flight touched down on the arctic shore he'd be in the dark in more ways than one.

Eighteen days of orientation hadn't been enough to span the gap between the spit-and-polish airborne division staff and command of a route-step specialist detachment. The equipment still awed him. Lights flashed, bells rang, and exotic clouds of multi-colored smoke filled the operations room. Procedures were straight from science fiction magazines. His men were a mixed bag of prima donnas and reluctant dragons.

Obviously, the first step was to seize the initiative. That was imperative, for The Word had preceded him. "Dig in quick!" was the low-level advice from Stateside barracks. "One round on the way. Your new CO is a pip, a wild Irishman replete with parachutist wings and swaggerstick. He fancies himself as come to cleanse the temple. Expect a demonstration of walking on water." Battle lines were drawn. It was left for the Major to close with the enemy. He did.

His first act was to assemble the one officer and knot of men who made up his reinforced squad. Across the dayroom the two forces sized each other up. Neither liked what it saw. The Major's policy directive was to the point:

"All hands will review pertinent operational and maintenance SOPs at frequent intervals to ensure thorough familiarity with fine details," he rasped. "These SOPs are the detachment's Bible. *Know* them! Failure to maintain the highest professional and personal standards will result in corrective action. Disciplinary action if necessary. The minimum prerequisite for promotion is required time in grade. More important, however, is all-around professional ability. Any questions?"

There were none. As the group filed out, it was all too apparent who was going to do what to whom.

These oral policies were confirmed in writing next day on the detachment's bulletin board. He'd won the first skirmish. Unfortunately, directives aren't worth the paper they are written on if they are not enforced. The Major's slogan was "Follow me!" But what if someone called his bluff and asked, "Where?" He needed a scheme of maneuver, and he needed it badly.

On-the-job education

Some sage once said, "Don't just *stand* there; *do* something, even if it's wrong!" Recalling this advice, and determined to embellish his meager storehouse of knowledge, the Major plunged headlong into an appalling jumble of manuals and SOPs, underlining, annotating margins, and seeking written clarification. While thus immersed, he began to prepare an examination, drawing questions, chapter and verse, from the publications at hand. *He* was learning. What better way to determine the proficiency of his men and to identify phases of training requiring immediate attention?

Six weeks after his arrival, the Major was ready to do battle at a place and time of his own choosing. He posted notice of an impending ex-

amination on the detachment's bulletin board:

"Basically, the test is designed to reveal the status of the detachment's training. It will serve notice to individuals of their own professional shortcomings, and by isolating training gaps will enable me to formulate a program to overcome deficiencies. It emphasizes cross-training to provide depth to the unit. The examination will be given all future replacements for similar reasons. Each man should learn a great deal from the simple process of taking the test and participating in the subsequent critique. It is my fond hope that it will stimulate thought and generate new ideas, so that this detachment can develop a comprehensive, workable SOP. Manifestly, memorization of all operational documents is neither possible nor desirable. The object of the exercise is to become intimately familiar with their contents, tab them for easy reference, and be able to find required answers without delay. The end result is progression from amateur to professional status."

Then, maliciously, he added: "My first official act upon arrival was to assemble all personnel and delineate my policies. All hands therefore had six weeks in which to prepare. I wish you well."

Complacency well jolted

Feverish action ensued. Candles burned in the operations room and in the base chapel. The announcement was an unmitigated shocker; no one had heeded the warning. So much the better. The results largely would reflect degrees of solid competence rather than the results of cramming. At last the Old Man was in the saddle!

In several respects the examination was a rousing success. It jolted complacency; it served notice that the Major had meant what he said; and it satisfied its primary purpose admirably by identifying in one swoop the best- and least-qualified men and the most pressing training deficiencies.

Results were analyzed from several angles. Overall scores were low. The highest mark was 70 per cent; the detachment's average was 60. Of the several test parts, only one—preventive maintenance—could even remotely be considered passing: 78 per cent. In more than half the group, 36 per cent of all questions were missed entirely or in part. When considered by examination section, the figures were even more revealing. Sixty per cent of one part were missed; 47 per cent of another. It was self-evident that these training areas cried for immediate emphasis. Others just as obviously were well under control. Some of the most glaring deficiencies would be easy to correct. Others indicated a need for protracted study by all hands.

Now the Major was on familiar ground. He shifted into high gear. To take full advantage of its teaching value, a detailed critique was held 38 hours after the examination, while salient points were still fresh in mind. Each question was covered completely during this two-hour period. Active discussion by all men was encouraged, and after a predictably slow start, the response was spontaneous. New ideas advanced by the men were incorporated into a preliminary operations SOP already in first draft.

Inevitably, several minor hassles broke out during the critique. Even though buttressed by six weeks of concentrated study, the Major still wasn't likely to be mistaken for Leonardo da Vinci or Albert Einstein. The Infantry School teaches, "If you don't know the answer, get it!" To this end, the Old Man recorded the entire proceedings on magnetic tape, and immediately after the critique played it back in the presence of his executive officer and detachment sergeant. Answers were researched on the spot and an errata sheet tacked on the bulletin board before recall. Phases 1 through 5 were complete: delineation of objectives; general preparation; examination; analysis of examination; critique. A breach had been made in the enemy's lines. Now to commit the reserve.

A reading file was established in the operations room, fed by additions the Major considered to be of special importance. It included a cross-section of new material as well as matter to be reviewed for emphasis. For example, at various times it included a copy of the training program after-action report he had forwarded to the parent organization; certain classified letters and memorandums from higher headquarters; all questions and answers from the first examination; and a completed draft of the detachment's new operations SOP. As for the last-named, everyone from executive officer to lowliest private was invited to sharpshoot the manuscript unmercifully. They were to recommend additions, deletions, changes in content, meaning or phraseology, and to question anything ambiguous or vague. The result was a finished document embracing the best ideas of every manjack in the unit. It undergoes continuous scrutiny and modification, thus assuring a current, living, breathing guide to local operations.

Special reading assignments, depending on individual initiative, were apportioned each week to cover a full seven-day period. Lessons were short enough to allow complete assimilation, but long enough to be worthwhile. They were slanted to fill needs made evident by the examination, by observation of daily performance, and by unannounced inspections. Any inclination to ignore these reading assignments, or to treat them casually, was brutally dispelled by incisive spot

quizzes which exposed culprits to the white light of inquisition.

Practical exercises were used in a variety of ways. Situations were contrived which demanded trouble-shooting procedures. This aspect of training took on the air of a treasure hunt, in which all men extended themselves in an effort to find cunningly concealed defects. Selective formal classwork was resorted to only after all other expedients failed to raise proficiency to the desired level. It wasn't required.

Solid performance sought

The entire program proceeded at a rather leisurely pace designed to create solid professionalism. Chinese fire drills were ruled out. After three months, all men were retested without warning. The new examination repeated questions most often flubbed in the previous test, and added a volume of new material. Those men who failed to register the desired improvement were tutored during off hours. Those who then displayed inability or unwillingness to respond would be busted for inefficiency, with almost four months of documentation to substantiate the action. No such action became necessary.

The nature of the assignment dictated that future training cycles be repetitive. Because the rate of personnel turnover was unnerving, constant review was essential if officers and men were to retain those fine points of the trade which differentiate mediocrity from excellence.

The system worked, even under trying conditions. Given the benefits of a normal tour, it should work even better. The Major enthusiastically contended that these methods, appropriately modified, would pay off anywhere.

Let it be said right here that our hero is an incurable idealist—a latter-day knight in shining armor. Years ago, he had been a private in the old brown-shoe Army, where authority wasn't to be trifled with. He still subscribed wholeheartedly to the belief that soldiers and specialists are not mutually exclusive. It was his unshakable conviction that no command can reach the heights on technical competence alone. Discipline and esprit are vital too.

He began an insidious campaign to subvert the violently anti-Army attitude of the draftees who made up the majority of his detachment. This undertaking began even before the formal training program was conceived, and later ran concurrently with it.

Generating esprit for Provisional Research Unit 1264 wasn't the easiest task in the world, particularly in the face of passive resistance. There were times when the Major felt like a vegetarian at a barbecue, but he stood up to the task.

He started by setting the example: trim haircut, spit-shined boots, military creases, glistening brass. His only concession to these proprieties was a flaming red mustachio which contrasted with his salt-and-pepper thatch when viewed from the rear.

The Old Army helped

The Old Man was on first-name terms with no one, not even his exec, and the practice was extended to noncommissioned officers and men. Technicians were enjoined to address sergeants by their titles. The arrangement would be reciprocal, although in fairness, the Major just can't bring himself to call *anyone* "Specialist." Somehow it doesn't sound military. The most vocal civilian-in-uniform, when retreaded from SP5 to acting sergeant, suddenly found himself on the side of authority, without quite knowing what had happened. Fraternization, that bane of the small, isolated detachment, was squelched. The Major was friendly with all, without lowering the bars, and scrupulously respectful of his men's scant privacy. He demanded the same in return for officers and noncommissioned officers.

Old Army pay procedures were inaugurated. The unit turned out in class A uniform, went

through the classic ritual in solemn dignity, and, except for the ever-present duty shift, was dismissed at noon. The fact that there really was nowhere to go had no bearing on conditions. The men were free to use this privileged time in any way they chose.

Renovation of the interior of the operations building was begun. False ceilings disguised beams and rafters; acoustic tiling lent a modernistic touch to walls; gallons of paint were applied; work benches, cabinets and tool boards provided places for the scattered gear of years. The entire job was undertaken by detachment personnel, since the astronomic classification of the unit's mission and equipment forbade its *sanctum sanctorum* to all but the anointed few. Grudging pride in accomplishment became mingled with cries of "Foul!" and "Overwork!" as the place began to take shape.

The Major regaled his command with wildly exaggerated stories of the good life in the airborne, and related Army anecdotes by the hour. Excerpts from the best histories of the Army and works on military policy found their way into casual conversations. Proud traditions and lore of the service were aired during bull sessions. Here was an important difference between a specialist detachment and a tactical troop unit: as executive officer of a battalion, the major had talked to young soldiers through channels; here he imparted his experiences directly.

His exuberance and enthusiasm began to make their mark. The unit spruced up. Spit and polish appeared where none existed before—perhaps not the airborne standard, but a phenomenal leap forward nonetheless. Flabby youths began to take note of their personal appearance. The gym became a popular spot. Men put out as they never believed they could. They began to learn, and with their new-found knowledge came the first glimmering of real professional pride.

The first and only disciplinary problem, one of incipient insubordination under pressure, was handled deftly. Many of the usual punishments just didn't fit. Restrictions meant nothing here; the stockade held few terrors in a land where everyone is closely confined anyway. Besides, the Major wasn't interested in superficial control by force. He wanted to create, not destroy. Therefore, he chose blistering reprimand as his first weapon. "Be a martyr, if you choose, soldier," his voice cracked like a bullwhip, "but be sure the end is worth the means. Never forget: to be a martyr you have to die." The point was well taken. The word got around.

The end is not yet. To be sure, the Major won the opening engagements, but sporadic guerrilla warfare persists. Perhaps final victory will come only after all old hands are reassigned and he has untainted recruits he can raise from pups. Of course, by that time the Old Man will be ready for rotation too. The detachment is small, but the challenge has been very great. Sometimes the Major feels like falling on his sword, but when in the grips of depression he is strengthened by the wise words of a former sergeant major: "A man who has to soldier under his own conditions is no soldier at all."

ARMY cerebrations

NAME TAGS ARE NOT MEN. *The business of printed name tags serves only to devalue those who wear them*

MSgt. HANS R. HAUKE

I believe that while our practice of wearing name tags on the uniform has certain merits, it has defects to which we give little thought.

Because his individuality is lost in a sea of names, the casual identification of a soldier is not conveyed through his own personality, his character, or his individual worth. Rather, the soldier's individuality is impressed upon the observer's mind only through a printed word that fails to identify the soldier as a human being. Hence, this display promotes mental laziness in the minds of the soldier's leaders and comrades because they do not need to learn and remember his name. So the printed symbol detracts from the man himself. Although many men are known intimately by their close associates, the circle grows ever smaller, and those outside of it become merely printed words.

It used to be that to a leader a soldier and his name went together to form an indivisible entity. Now, with name tags, he knows the name but not the man. A name tag is but a symbol, and being artificial it fails to engender comradeship, unity, and knowing your man. It is of no help in applying leadership principles.

Before the advent of name tags a first sergeant knew every man in his company, some by their first names. This is no longer true, probably even among squad leaders. Yet the average platoon sergeant can, in a few weeks and with a little effort, learn to know all his men and their personalities without the help of name tags. What's more important, he will get to know them better.

Presently the inclination is to know the tag instead of the man. In the absence of individuality, then, recognition that is based on printed symbols makes for less differentiation among men's characters, their abilities, and their physical attributes. The end result is lack of esprit, lack of volunteers, and lack of initiative.

If we continue this business of wearing name tags it will serve only to further devalue all who wear them. This might well result in stripping each soldier of his personal importance, and will ultimately affect those human values which are so essential.

START TALKING. *Let's put all our forensic power at work telling the Army's story*

MSgt. FORREST K. KLEINMAN

A group of public relations men was debating the merits of various media for influencing public opinion. Television, radio, newspaper, magazine, direct mail, billboard—all came up for discussion and each had its champion. Finally a quiet oldtimer spoke up.

"For the best coverage, you need them all," he said. "But nobody's even mentioned the medium with the top ratio of coverage to cost. It's the club podium! Not only does it cost the advertiser nothing, but it provides selected audiences of influential people, captive attention and comparatively long exposure time for the message. If properly used, it can even get the message disseminated to the public by *other media* free of charge."

Opportunity for proper use of this priceless medium for telling the Army story to the public is virtually unlimited. Less than an hour's drive from any AUSA chapter or military installation in the country, hundreds of club podiums are open to Army speakers.

In San Francisco alone, the Chamber of Commerce lists more than 2,000 clubs and social groups. Memberships range from less than 50 to more than 500. Most meet at least once a month, many weekly. Nearly all solicit guest speakers.

Are we making the most of this opportunity?

Information officers and community relations experts to whom I put the question say we are not. The Army's podium output is just a small fraction of the potential.

In no way, however, does this reflect lack of effort by our general officers and other senior members of AUSA. They accept as many invitations to address civilian groups as they can sandwich into their busy schedules of official duties. Often two or more public speeches are crammed into a single day during inspection trips to installations of their commands.

One famous veteran of the "fried chicken circuit" wryly joked that he was getting to be like a fighter who starts swinging at any bell-like sound. "Just the ring of a dinner fork on glass and I start a speech."

Even so, many senior officers are compelled to

decline more invitations than they accept. Having concluded from experience that military speakers are hard to get, some program chairmen no longer try. Many others think of the possibility only for Armed Forces Week, Veterans Day and the Fourth of July.

To up our podium output, we must first expand our concept of what constitutes a qualified Army speaker. Within the membership of any AUSA chapter or Army unit are many men able to speak eloquently for the Army. At some posts we even have privates with professional platform experience as teachers, actors, radio announcers, salesmen, and the like.

By considering able speakers of all ranks for our speaker bureaus, we could both enlarge and *improve* our capability for telling the Army's story. As matters now stand, most senior officers are compelled to read their public speeches because of the demands on their time and the Army-wide implications of their words. Unhampered by such considerations, speakers of lower rank could memorize their presentations. With more speakers to share the load, our senior spokesmen could then concentrate upon fewer and better talks delivered mainly to the largest and most influential audiences.

The improvement would be more than merely a matter of delivery technique. In some instances, the very fact that an Army speaker is *not* of high rank might make his presentation more impressive. For example, consider the effect upon an audience of a speech extolling the merits of military training if delivered by a private who has just finished basic training.

At the same time, we should enlarge our concept of what constitutes a suitable subject for an Army speaker. Virtually every field of knowledge and human interest is represented in the clubs and fraternal organizations of civilian communities. Every Army post has experts who can talk on subjects of special interest to such groups. By matching speaker and subject to the audience, we could greatly increase the number of clubs actively interested in obtaining Army speakers.

Instead of the "direct sell' style often used by Army speakers, the Army's message could be woven into talks on other subjects by the use of analogy and examples from military experience. Business and industrial firms long have recognized the value of this indirect technique. Many pay handsome salaries to traveling speakers who talk on a variety of subjects seemingly unrelated to the merits of their products.

However, I do not suggest that Army speakers sugarcoat fundamental issues of national defense. A strong warning to the contrary was sounded by Gen. Herbert B. Powell in a recent address before the Association of Military Schools and Colleges:

"The Kremlin-sponsored program to eliminate military training in America has been heavily reinforced in recent years. In response, some defenders dwell upon the value of military training in curbing juvenile delinquency, developing good posture, teamplay and similar benefits.

"In my opinion, it is a mistake to soft-pedal the real issue! Regardless of the many other benefits that our youth derive from military training, we must never lose sight of its paramount purpose. . . . It is precisely because military training is designed to develop men for the ultimate trial of *combat* that it is so effective in preparing them for other trials of life!"

Having organized large speakers bureaus of varied ranks and specialties, the next step is to offer their services to program chairmen of all clubs in every community. Names and addresses are readily obtained from local chambers of commerce. The offering letters should list subjects and speakers' qualifications and should enclose a return form for the program chairman to indicate dates, times and subjects desired.

Public information officers say that many Army speakers are missing the next step in upping our podium output. Hence the emphasis:

Provide the club (through the local PIO) *with sufficient advance copies of the speech for release to the press.*

Only when this is done is the gist of the message likely to be published in local newspapers. The chance that thousands instead of hundreds will get the message is certainly worth the time and trouble involved.

Even the smallest clubs have bulletins, newsletters and magazines. Their circulation is always much greater than the size of the audience. Very often their editors will publish speech material that might not be considered newsworthy by editors of other news media. But in order to keep their editions timely they, too, need advance copies of a speech.

(This use of advance copies of a speech does not obligate the speaker to recite it word for word from the podium. He is still free to ad lib and make minor variations during delivery.)

The speaker should also take some copies with him to the club meeting. Often members will ask for a copy to give a friend. Sometimes they will even send it to their Congressman!

Preparing a written version of a speech can multiply the potential of any podium. Last year, for example, an Army officer gave a brief talk to an interdenominational meeting at the Fort Meade Chapel. Had he spoken off the cuff—however eloquently—only a few hundred service people would have received his message. Instead, it was published by *Vital Speeches of the Day*, which brought it to the attention of thousands of leading citizens in every field of endeavor and placed it in all reference libraries. In addition, it was published by an agency which provides models for college and high-school public-speaking classes. Consequently that speech will be read and heard throughout the country for many years to come.

While not every good speech can hit the jackpot, any good one can give the Army message a lot of mileage. Instead of filing and forgetting an address that has been well received, it should be given again and again to similar audiences in other communities.

The same principle applies to speech subjects, information officers agree. For example, the fact that many public speeches in 1958 and 1959 dealt with the Army's need for air mobility does not make the

subject out of date in 1960. On the contrary! It indicates that more speakers should tell more people more often in 1960.

This is true of all the Army's long-standing critical requirements. But in upping our podium output, we must be careful to balance reports of what we lack by reports of what we are accomplishing. Both confidence and need are essential to progress.

THEME-PIECE FOR ARMY BANDS. *Resurrection of fife-and-drum music would identify the Army's martial music*

Col. WILLIAM FOLEY

Almost always I am favorably impressed by the performance of a U. S. Army band. But I hear its music with the feeling that something is lacking—some traditional means of identifying the group as a *U. S. Army* band. Perhaps what is needed is a few minutes at each ceremony devoted to a theme piece, or a theme-type rendition unique to Army bands.

A spine-tingling effect such as that produced by bagpipes is fine for the United Kingdom and British Commonwealth forces, but use of this instrument is not in U. S. Army tradition. However, we can get a similar effect from the simple fife and drums. We do have a great deal of U. S. Army tradition in the use of these instruments, from Colonial times up through the Civil War. Why not revive this feature of martial music, at least in a small way?

I know that fife-and-drum music still plays a small part in ceremonies at certain military schools. I also realize that there have been previous attempts to revive fife and drum music within the Army. General acceptance in the Army, however, is still lacking. Perhaps these attempts have been too elaborate—too many fifes, too many drums, and too much bother and expense with costumes like fancy Colonial uniforms. This approach may well have deterred general acceptance.

Maybe the experts can figure out a better solution, but it seems to me that a theme-piece, or a family of theme-pieces—something like the old "March Along" ballad—are worth resurrecting. Who knows? This effort might also be the spark to revive group singing while marching, at least in a limited way. This is another old tradition almost forgotten in today's Army.

The "March Along" ballad, for example, lends itself well to fife and drum and to effective group singing by untrained voices. You know how it goes:

(1) March, march, march along
(2) To the drum and fife,
(3) Merrily, merrily, merrily, merrily
(4) O'er the path of life.

Even a layman can see that verses 1 and 3 lend themselves to the piercing notes of the fife, while verses 2 and 4 are appropriate for drum and fife combined. An appropriate rataplan before and after the theme would add to the effect. The cost in time? A few minutes, perhaps only while the band is marching on or off the parade ground.

When sung, the "March Along" ballad is rendered as a "round" by four numbered groups. Each group joins at the verse corresponding to its number. Then all groups join the singing until a signal, whereupon each group stops at the end of the verse with which it began. Thus Group 4 finishes alone, just as Group 1 started alone.

Other old ballads such as "Yankee Doodle" suggest themselves, and adequate research should unearth some real jewels. Have you ever heard "Old Soldiers Never Die" with fife and drum as a part of a retirement ceremony? Neither have I, but I think it has great possibilities!

I think the words to ballads such as these are virile enough for soldier acceptance; however, the tradition of singing soldiers in the U. S. Army has been dormant too long to change abruptly. So let's start with the instruments. I suggest that some band try this theme-piece idea with fifes and drums. Then sample audience reaction. I think the response would be surprisingly favorable.

VALUE OF EXTENSION COURSES. *No one has yet come up with a better method of non-resident instruction*

Lt. Col. JOHN C. VALLOR

As a former USAR advisor I have seen both good and poor training in Reserve outfits. Having been training officer and G3 of a major post, I can say that even the Active Army has its share of poor training. Training is only as good as the unit commander wants it. Too often the movie, a training aid, is allowed to be the instructor because no one is expected to work. An example of this desire not to work is in Captain Gallagher's article "Marching Off to What War?" in the July issue. There we are told that extension courses are bad because we are required to do 30 (or 80) hours of lesson time.

I don't know whether or not the Russian or Red Chinese high commands have extension courses, and I don't like the idea of having them decide how we will get any of our training. After having been schooled rather well by U. S. and foreign experts at a special course on the Soviet Union, having discussed Russian training with a former military attaché to Moscow, and having taught foreign officers at one of our service schools, I believe that probably many Soviet officers too complain about training. I don't know whether they have extension courses, but if they do, some of their officers would have trouble because of poor basic education. Their educational level is not high.

As for no one having a kind word for extension courses, in the Extension Courses Division of the

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First of a family of "Flying Cranes," the Sikorsky S-60 (above) will soon be joined by the newest member: the twin-turbine S-64, with an eight-ton payload.

Carrying its loads externally, the "Skycrane" nimbly switches from troop-carrying pods to missiles, from supplies to construction equipment, and even to complete maintenance vans. It carries cargoes of any shape or size up to its lifting capacity. Termed a "prime mover," it brings the flexibility of the truck-tractor to air transport. And its simple skyhook pickup eliminates time-consuming loading and unloading, reduces turn-around time to a minimum.

The crane concept, tested and demonstrated for many months in the S-60, has opened the way for the current design and development of a family of Sikorsky turbocranes with payloads up to 40 tons.

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U. S. Army Artillery and Missile School we frequently receive unsolicited praises for our courses. Complaints are rare. Having undertaken 33 subcourses during the 1930s, I was helped tremendously. These courses, prepared by the Field Artillery, Signal and Engineer Schools, were excellent. Today, because of greater experience, our service schools are turning out a better product. Many of World War II's successful officers had only an extension courses education.

The service schools keep subcourses up to date and parallel, so far as practicable, with the material they offer resident students. The student who cannot afford the time for resident instruction must be allowed to keep abreast of his contemporaries in active service. Extension courses help do this for him. No one has yet come up with a better method. I am convinced that practically all extension courses students are seeking knowledge, not credit hours because they may have been ordered to do so.

The Army is not alone in recognizing the value of extension courses. Hundreds of universities, colleges and private schools offer fine programs through correspondence. It is a most economical means of teaching large numbers of people. Less than 75 persons prepare and administer subcourses for almost 22,000 students registered at the Artillery and Missile School. We have been fortified recently in our knowledge of the quality of our product by a study by a board of eminent educators from two great universities.

As for the implication that cheating is common among students, if ever there was an honor system in examinations, extension courses have it. The "No Unauthorized Assistance" is, I am sure, fully understood to mean that responses must reflect the student's effort, not his expert buddy's. The cheat, like the student who merely answers without trying to acquire knowledge, does himself a disservice. He would do precisely the same thing if he were a resident student at a college or service school. Admittedly, it's easier to cheat on extension courses. Unfortunately, honor cannot be taught by mail. I believe most students are honorable and that they strive for knowledge. They don't believe anyone will be fooled very long by certificates of completion or hours of credit.

Captain Gallagher's remarks about extension courses lead one to believe that students don't like them, that they cheat on examinations, that they don't study anyhow, and that their wives are unhappy. Besides, the Communist high command might not approve of this method of training. To quote King Cole's generals, "The Army's gone to hell."

THAT SLOW DIAL TONE IS OUT. *Developments in switching bring new dimensions to telephony*

Col. CHARLES W. GIBBS

Lost under the glamor and publicity attending the highly successful Tiros weather satellite was an event which occurred a few days prior to that launching. The overshadowed event was the delivery to the Army (in late February 1960) of the first tactical electronic switchboard ever built.

Since its introduction into the field will be a gradual one, the electronic switchboard may scarcely be noticed and therefore may not be exploited to its full potential unless it is known by all concerned.

One fundamental headache for the communicator is the necessity to conduct switching operations. The efficiency with which switching can be accomplished provides the major limiting factor, which in turn determines the order of efficiency of the over-all communications system.

If switching capability is limited, the number of calls passed over any communications system is correspondingly limited. Conversely, the faster we can switch, the more calls we can handle.

So from the standpoint of speed the electronic switchboard is a godsend. Its switching functions are accomplished electronically in a manner similar to the functions of an electronic computer. Switching therefore can be accomplished in microseconds; in other words, at computer speeds.

To get a better idea of the comparative speed of an electronic switchboard compared to that of a conventional dial switchboard, we can demonstrate with a simple experiment. Remember, your switchboard is not an electronic one, but electro-mechanical. That is, it works through relays which have moving parts—one relay for each switching operation.

Pick up the handpiece of your dial telephone. When you place the receiver to your ear you hear the dial tone. Now press the hook-switch and slowly turn the dial tone off and on two or three times. Notice the short delay before the tone returns each time you release the hook switch. There is a distinct click, a slight pause, then the tone. The electronic switchboard can perform the entire switching operation for a five-digit number during the period of that pause!

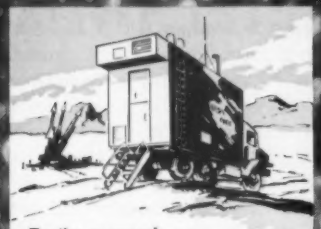
Now observe how slowly the dial returns to rest when you release it after each digit. The action is slowed down by internal adjustment to allow time for the mechanical relays in the switchboard to function. Electronic switching happens so fast that no delay is needed. Pushbuttons are used instead of a slowly unwinding dial.

If faster switching and easier dialing were the only benefits derived from electronic switching, its use would not be justified. Even when staff officers are in such a hurry they can't wait for an ordinary dial to unwind, from the cost standpoint more staff officers may be a better answer than electronic switching gear. Such equipment is expensive in terms of dollars.

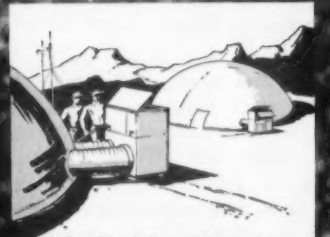
These advances in switching and dialing speed, although spectacular, are not the main advantage of this new hardware. Electronic switching allows us not only to switch voice telephone calls automatically. When used throughout an area communications network we can also switch trunk circuits around damaged zones.

Ultimately we can have automatic build-up of

Compact air conditioning for ground support use...



Trailer mounted refrigeration unit, 5 tons capacity



Inflatable shelter refrigeration unit, 7½ tons capacity (unit shown above)

Helicopter transportable hut refrigeration unit, 1½ tons capacity

AIRESEARCH 400 cycle ac Freon ground air conditioners are the most reliable and compact systems produced for ground cooling applications. They are easily transportable by helicopter or ground vehicle to any field location.

The compact, fully automatic unit shown at left, for example, measures 5x5x2 ft, weighs only 550 lb and provides 7½ to 10 tons of cooling on a 125°F day. It also provides 90,000 Btu per hour heating.

The heart of the system is a simple centrifugal Freon compressor which has only *one* moving part.

A hermetically sealed unit, it operates virtually without vibration and is unaffected by either attitude or oil level.

Essentially the same AiResearch air conditioning system used in today's jet airliners, these lightweight units have more than 500,000 hours of proven dependability.

Built to withstand rough handling in the field and operate dependably under the most severe weather conditions, rugged air conditioners of this same basic design are available, or can be built to provide from fractional tonnage up to any capacity of ground cooling desired.

• A brochure describing AiResearch ground air conditioning systems may be obtained by writing to Environmental Controls Project, Los Angeles Division.

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trunk capacity during peak traffic loads, automatic preemption of idle trunks to handle high-priority traffic, and automatic availability of seldom-used trunks for routine traffic.

One characteristic of electronic switchboards is that they are first cousins (if not brothers) to electronic computers. This means they can be used to switch data transmission circuits which interconnect distant computers. They can be connected to a computer and receive programmed switching instructions from it covering any number of alternative situations. Their second or third generation may be computers as well as switchboards.

Does this sound fantastic? It is, but even so, it is well within the capability of truly electronic switching. Such things are impossible with manual or with the electro-mechanical switching equipment we now have.

Fully transistorized, the new switchboards require only a fraction of the power used by ordinary boards. They have practically no moving parts and are completely silent.

Using printed circuit cards and module construction, they lend themselves to mass production. Maintenance is simplified. Automatic fault control circuits are an integral part of these switchboards. If only one line of a 200-line electronic switchboard goes bad, the trouble is isolated automatically when an alarm light goes on in that section. The switchboard continues to function while the faulty circuit unit (a card no bigger than your hand) is replaced by the maintenance man.

The components of these switchboards can be more efficiently packaged to conserve space and weight. Electronic components do not move and hence are less affected by dust, vibration, and moisture than the critically adjusted components of an ordinary dial switchboard.

Production and maintenance considerations lead quite logically to the matter of costs. As with most major classes of new military equipment, the initial cost of electronic switching gear is very high. Because it is a brand-new technique, and a basic advance in the state of the electronics art, it is even more expensive than would ordinarily be the case.

Recent and continuing experience in missiles and other fields of Army modernization shows that scientific and technical breakthroughs are very expensive. The electronic switching equipment is no exception. However, as with other gear, dollar costs cannot be the sole consideration in the matter of whether or not the Army should be equipped in a certain way. The modern Army's equipment is exerting ever-increasing influence on the nature of its tactical doctrine. With current doctrine stressing tactical mobility, speed, and command control, equipments which materially facilitate any of these functions is worth the expense. Especially those which can improve the efficiency of command control.

Communications efficiency is the heart of command control. Electronic switching is the heart of the Army's ability to improve its communications efficiency.

With the first electronic switchboard on hand and others scheduled for early delivery for test, it may be said that the technical obstacles to automation of battlefield communications have been largely overcome. We have in being a major technological advance which we can either exploit or allow to wither on the vine. I submit that while we should keep an eye on the sky, we will be well advised to miss no significant advance in our ability to fight on the ground.

If we fail to fully exploit the new potential inherent in electronic switching, we may be denying our Army its most important advance toward modernization which has come along in years. When evaluated in the light of increased capability, the question is not "Can we afford it?" but, "Can we afford to be without it?"

A LESSON FROM SOCRATES. *A military leader can improve his organization by understanding himself—and those surrounding him*

Capt. FRANK P. VELLELLA

A perfect organization is something just out of reach. If the executive is aware of this and exercises patience in his activities, he can avoid a great deal of frustration. He must work with imperfect materials. The test of his abilities as an administrator will be how well he can accomplish his task with these materials through the efforts of other people.

In what follows, I have selected only four of the many major generalizations about the formulation and administration of policy which are taught in civilian schools of business administration and which seem to have special significance for every member of the armed forces.

One of the most difficult things an executive must learn is that inaction might be the best action to take in certain situations. Many men have been successful because they have been Doers. But as they work their way up the ladder of success, there appears to be less opportunity for "doing" and more opportunity for coordinating, supervising, and directing. Making decisions and demanding immediate results without considering the human element and without thorough study of all the issues will result only in difficulty.

The first step should be to determine whether action is immediately needed or whether it is possible to spend more time analyzing these problems or "flaps" which seem to require an immediate answer.

Everyone has some kind of goals or objectives. Unfortunately, unless there is a determined effort to be specific and clear, few people know exactly what their objectives are. (Can you write out your personal goals and objectives?) Specific goals must be set before both planning and measuring can be accomplished efficiently.

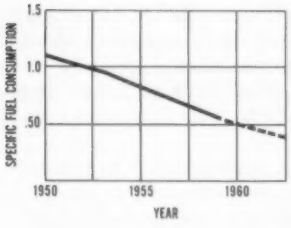
How many times have you seen clear-cut objectives or plans which consider the *future* position of the organization? Is too much concern devoted to immediate operations?

Small gas turbines soon to surpass piston engines for competitive applications

by Herbert Kunzel, President
Solar Aircraft Company
A Subsidiary of International Harvester Company

The gas turbine engine has made news this year as it has expanded into new and broader applications in the prime mover field. Behind this advance is continuing improvement in design and production. Even more advanced gas turbines will be developed in the next few years. In the small engine class (under 1000 hp) gas turbines will soon surpass overall piston engine performance and cost for competitive applications. They will also retain the inherent advantages of the gas turbine over the reciprocating engine.

One of the major reasons for this prediction is an impressive improvement in gas turbine economy. Previously, fuel consumption and high initial cost have kept the turbine out of all but selected power assignments. Industry and the military both thought the engines too expensive for most applications.



Through constant improvement, however, Solar has been steadily bringing simple cycle, small turbine specific fuel consumption down to an area competitive with piston engines. The fuel consumption of Solar's early 50 hp engines in 1948, for instance, was about 2.25 lb/hp-hr. The 1100 hp Saturn engine, which went into production this year, has the excellent simple-cycle fuel consumption of only .63 lb/hp-hr. Solar's experienced engineers improve life, "producibility," and performance characteristics with each new engine. At the same time, production costs are lowering rapidly.

Another significant advance in Solar turbine development has been the evolution of a unique design philosophy. Most gas turbines fall into one of two extreme categories: 1) Lightweight, high horsepower aircraft turbines, built to be as light as possible (about ¼ to ½ lb/hp), and 2) conventional industrial engines designed along the lines of steam turbines with a ratio of about 10 lb/hp. Both have inherent disadvantages. The aircraft turbines are relatively delicate with consequent problems of frequent overhaul and short life. Massive engine design, on the other hand, involves unnecessary bulk and difficulties with thermal lag and distortion. In either case, inherent advantages of the gas turbine engine are diminished and initial cost is adversely affected.

Solar's approach has been to develop a family of gas turbines that have both long life and light weight. The Saturn engine, with a weight-to-power ratio of 1.1 lb/hp, is heavier and more rugged than aircraft engines but much lighter than the usual industrial gas turbine. Although it is designed for long life, it has no more materials than are necessary to satisfy structural and thermal requirements.

Promising even further improvements in the turbine engine is the combination of Solar with International Harvester Company this year. IH saw the advantage of more power per pound several years ago. Their research and development has stressed performance and much work has been done by them on regenerative cycle turbines to reduce fuel consumption.

To basic research, they have added their many years of experience and leadership in high performance and low cost through efficient production of many thousands of IH engines for trucks, construction equipment and farm machinery.

Solar's successful Saturn engine development team and the combined research and resources of the two firms are now focused on further engine development in the area below 1100 hp. Preliminary design for a turbine in this range indicates that the following standards are feasible:

1. A life cycle equal to or better than conventional diesel engines—with considerably less maintenance.
2. Fuel consumption in the .4 to .5 lb/hr range.
3. Cost competitive to conventional reciprocating engines.
4. Inherent ease of starting and operation in a wide variety of climatic conditions.
5. Small size and light weight.

Developments like these are certain to continue the increase in turbine applications and use.

For additional information write to Dept. H-301, Solar Aircraft Company, San Diego 12, California.

Saturn engine powering oil well fracturing unit

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How many times for over a period of years have you seen numerous sections and branches being appended to a particular organization until a complete reorganization became necessary? As might be expected, there was also quite a bit of disruption of operations. This disruption could have been kept to a minimum—or completely eliminated—if the goals of the organization had been clearly delineated and plans had been outlined to achieve these goals.

Military personnel should look at an organization and ask the same questions as businessmen: "Where are we now?, Where do we plan to go from here?, How will we get there?" Ideally, because of rotation of personnel, these efforts should be documented.

One simple factor that always marks a good administrator or leader is his ability to separate the important from the unimportant. It can become very frustrating to get bogged down in facts, words, or figures which try to hide what is important. A great amount of undigested information is of no value until it has been interpreted.

Reports is an area where a subordinate has a tremendous opportunity to contribute to the organization and to himself. Whether it be a verbal or written report, if the subordinate will answer the specific question, take into account the attitude of his superior, and clearly present the important aspects of the issue to his superior, he will find his counsel being sought more and more often.

How many times have you failed to take into account the attitude of your superior? How many times has an idea or paper been returned when it might have been accepted with a little previous consideration of your superior's attitudes? The effective subordinate should make a conscious effort to try to determine the attitude of his superior instead of "objectively" trying to present an ideal solution which might have little chance of being accepted.

The pressures of a job may make the individual feel that he does not have time to be "sociable" with either associates or with others when on the job. This is a mistake. Often the opportunity to pass the time of day with different people can provide the fresh thought needed to solve a difficult task.

Such informality can encourage information and ideas from others—information and ideas which may not be made available through formal channels. These factors are especially true in those situations where the executive himself cannot hope to have all the technical knowledge or special knowledge to make a wise decision.

The successful administrator or leader takes advantage of these facts by arranging his daily workload to provide the time for informal discussions with others. He makes it a point to be available for conversations with subordinates—not just in his office but at their place of work.

Each of the generalizations mentioned above overlaps the others. The field of primary overlap is in human relations. An administrator or leader must be able to accomplish things through the efforts of others. To do this effectively, he must be able to recognize that each individual perceives a situation in light of his own values, beliefs, and ideas. The same action or situation is interpreted differently by different people. The administrator or leader, if he hopes to be successful, must be constantly aware of this and make a conscious effort to understand his subordinate, his associate, and his superior.

The statement "Take care of your men" is often heard in the military. What is not usually heard is that the leader should take care of his men in those matters that they feel are important. In order to accomplish this the leader must learn to listen and accept. Only then can he hope to truly accomplish his mission.

To be successful, one must relate himself to others. But before the administrator or leader can do this effectively, he must be able to understand himself. He must be able to understand what his actions mean to him and what they mean to others. He must be capable of self-analysis and self-criticisms. Are you?

IF HE DOESN'T GET THE WORD

(Continued from page 67)

be engaged, a target of opportunity must remain in place for considerably longer periods than in nuclear-free action. The determination of just who to warn, whether to keep gun crews firing, whether to continue the attack, how to get the word to wire crews, to vehicles on the road, to ration breakdown, to men asleep or overlooked in the rush of things, or in conditions not considered in this discussion, will emerge to bedevil the commander who must continue his tactical mission. Currently, there is no system that insures each soldier in the division or the battle group will be warned in time to take protective measures. Current signal equipment is adequate to warn personnel at fixed duty stations. As for the others, the commander must weigh the calculated risk of determining the necessity for fire against the possible effect upon the combat capacity of a portion of his command. The time required to disseminate the message will vary with conditions. Yakima, with its hilly terrain, presented difficulties in line-of-sight. Flat terrain may not. The status of operator training, the condition of equipment, even the availability of batteries, will combine to make the factor of time an even greater imponderable.

In his letter transmitting the report to CONARC, Major General Louis W. Truman, then Commanding General, 4th Infantry Division, and Deputy Exercise Director for Dry Hills, summed it up in this way: "Although many important factors have been brought to light by the conduct of this troop test, it is believed that this test represents, at best, only an initial approach to an important area that requires further study."

R.O.T.C.

(Continued from page 20)

Army." And that One Army is critically dependent upon the ROTC as the principal source of its officer production in peace as well as in war. Yearly, the Army requires approximately 14,000 newly commissioned college ROTC graduates for its several components. Of these new officers, some are integrated into the Regular Army on a career basis, some take up duty with the Active Army on tours of various lengths, and others are utilized to maintain the vitality of the Ready Reserve Force—a true citizen-soldier use of the ROTC graduate.

The Army's preference for a required basic course of two years is related to the mission of its ROTC program; namely, of producing annually 14,000 officers. Through such a two-year basic program, the Army can more fully impart ideas of citizenship, leadership, and motivation for service and, through the broad base which a required program provides, can more effectively select outstanding students for the advanced course. It is the Army's sincere conviction that it cannot meet its officer needs (neither qualitatively nor quantitatively) except through the broad base of selection provided by a required two-year basic course.

Just as the primary mission of the Army ROTC program is to provide the junior officers for the One Army, a vital secondary mission, as already mentioned, is to impart citizenship training, develop leadership potential, and stimulate and motivate the student for future service in behalf of his country. Thus, it is clearly apparent that the U. S. Army does indeed live the concept of the "citizen ROTC officers" as being a vital element of the system and an integral part of the national defense effort.

Today, the Reserves, officered by ROTC graduates, are so interwoven into and so inextricably a part of the Army troop structure that the Army's role in national security could not be accomplished without them. The Reserves are a modern force, tailored to meet the requirements of national security, and are trained with the same standards—and geared to the same technical and tactical concepts—as the Active Army.

As General George H. Decker, the Army's Chief of Staff, remarked in a recent address: "I can visualize no war of the future in which the Army National Guard and the Army Reserve would not be called upon promptly to furnish units and personnel to augment the Active Army. That is why we continue to emphasize the importance of maintaining our civilian components in the highest possible state of combat readiness and that is why the true meaning of the term One Army far transcends the fact that all components wear the same uniform."

The history of the United States shows a record of victories, not defeats, both in peace and war. This leads to the conclusion that the concept of the citizen-soldier is sound and the ROTC program adequate. Most important of all, it proves irrefutably that the end product is not only the best soldier, but the best citizen.

Many suggestions have been made, with sincere good intentions, for modifying the ROTC program, including those in the October issue of ARMY. All the facts presented in that article—and many other suggestions—have been weighed and considered. And while it is apparent that as time goes on, changes will come about, nevertheless it is a fact that the current ROTC program is the one which best meets the nation's needs today.

In summarizing the whole problem three points must be stressed:

The modern military world demands dynamic leadership, and today's modern One Army requires the most highly trained officers. The ROTC program is designed to meet these demands and to provide from its graduates officers capable of truly professional ability, regardless of the component in which they serve.

To insure depth in the nation's military structure, the reservoir of Reserve officers with education and training backgrounds similar to those of professional career officers must be constantly replenished.

The ROTC has turned out in the past, and is capable of producing in the future, its proper share of quality personnel that are required to help lead the nation's military forces to victory.

EDITORIAL

(Continued from page 18) the future. This is like saying the Prohibition amendment should have stayed in the Constitution because anyone who wanted a bottle of whisky had no difficulty in getting one either through a doctor's prescription or outside the law. The restriction on Army aircraft has many inhibiting effects, not the least of which is one placed on those aircraft companies that are intensely interested in Army aviation, even to the extent of putting their own money into design studies. When they do this they are sensible enough to work within practical limits of what they think may be acceptable and saleable, and they therefore tend to stay within the weight restriction imposed on the Army. Were that restriction lifted the aircraft industry would feel much freer to forge ahead with new and promising designs that go beyond the present arbitrary limits.

This is most necessary. The recommendations of the Rogers Board of a family of air vehicles *(described on pages 52-53)* are for what is possible in the near future, and not the end of development in Army aviation. When you see a helicopter armed with rockets engaged in suppressive fire, remind yourself that what you see is the best the Army can do now and not at all what would be possible in the not-too-distant future, if the Army and the aircraft industry were free to forge ahead with new ideas based on missions rather than arbitrary empty weight of vehicles.

ARMY irons in the fire

The Reorganization of Army R&D

The recent reorganization of the Army's research and development organization is an evolutionary step in a long march that goes back many years. But, clearly also, this latest step was aided and abetted by the explosion in military and science technology during the past 15 years, and especially during the last half of that period.

This exploding technology forced the Army's R&D organization into a frenzy of growth at many levels. While it would be inaccurate to say that it got out of hand, good managerial practices did dictate that the Army's organization for R&D needed thorough study and review. This was especially the view of Mr. Richard S. Morse, the Army's Director of Research and Development. He held that a better functional alignment of Army R&D was essential.

The upshot was the creation of a board chaired by Assistant Secretary of the Army George H. Roderick. On 23 February of this year this board submitted its report and recommendations to the Secretary of the Army. The result was a Department of the Army directive which included 26 organizational or procedural changes.

It gave the Chief of R&D, under the functional policy supervision of the Director of Research and Development, significantly increased authoritative direction and control over the Army's R&D functions and installations used primarily for research and development.

Now, the Chief of Research and Development exercises control over the technical services, in the R&D realm, through a line of responsibility and authority paralleling that which exists for the Deputy Chief of Staff for Logistics in respect to logistical matters. In furtherance of this direct control of the R&D effort, the chiefs of the technical services have been directed to establish clearly delineated channels between their respective R&D chiefs and field installations engaged in R&D work. These channels will insure an expeditious routing of information throughout all levels of the R&D organization.

The impact of this directive upon the other Department of the Army staff agencies lies in the areas of technical intelligence, manpower and long-range planning. Greater emphasis will be placed upon the gathering of technical intelligence. To this end, CONARC, Deputy Chief of Staff for Military Operations, and Chief of Research and Development will provide the objectives and targets for technical intelligence. Closer coordination between Army R&D and technical intelligence structures will be effected to provide for timely integration of the technical intelligence effort.

3-D PLOTTER

This three-dimensional plotting device, developed by Chrysler Corporation Missile Division engineers, uses a pen nib to trace the flight patterns in clear gelatin. Flight patterns are picked up by radar and motion of the pen nib is controlled by a computer interpreting the radar pick-up. Multiple flight patterns can be recorded at the same time.

EYE ON A SOLAR CELL

A new type of solar cell, which can convert sunlight to electricity even under intense atomic radiation, is placed in the chamber of a Van de Graaf particle accelerator to test its atomic endurance. The tiny A-resistant cell was developed by the Army's Signal Research and Development Laboratory and is shown being tested by a scientist at the RCA laboratories, Princeton, N. J. The new cell, consisting of a small disc of specially treated silicon, is mounted on a copper block in the engineer's hand and is surrounded by a coating of white phosphor material for the tests.

In the area of personnel and manpower, the Chief of Research and Development is given control of all R&D spaces, civilian and military, throughout the Army. Spaces for civilian personnel, filling R&D positions at the technical service level, are bulk-allotted to the Chief of R&D by the Deputy Chief of Staff for Personnel. Suballotments are made to the technical services by the Deputy Chief of Staff for Logistics, as prescribed by the Chief of R&D. All personnel actions affecting key R&D personnel throughout the Army will be subject to scrutiny or action by the Chief of R&D.

The managerial aspects of the entire R&D program are brought under a higher degree of scrutiny by the Chief of Research and Development. One such aspect is the

need to improve the means of coordination and presentation of R&D program reports. A study is being conducted to determine if some form of automatic data correlation and presentation can be used. Another aspect is the need to refine the concept governing presentation of the Army's over-all long-range R&D objectives to the Director of Defense Research and Engineering. Such improvement will advance the attainment of national goals through coordination at the highest R&D level.

The Chief of R&D is further directed to improve the methods and systems of keeping the scientific and industrial communities abreast of research and development requirements and problems. To this end, an eight-volume publication, *The U. S. Army Research and Development Problems Guide,* has already been prepared and is being distributed by the Army's seven technical services and the Army Research Office. This publication presents more than a thousand problem areas for which the Chief of R&D desires solutions, but for which present funding or private effort has not permitted adequate research. Industry has given overwhelming approval to this program.

* * *

For those interested in the evolution of the Army's organization for research and development, December 1924 is a good starting date. It was in that month that Army Regulations 850-25 was published representing the first formal recognition by the Army of research and development as an Army function. That 850-25 bore the title "Miscellaneous" may be indicative of the puzzlement its author or his superiors had as to the place of R&D in the Army.

AR 850-25 directed that "the various supply branches, in connection with the using branches, will conduct the development and research work necessary to produce articles meeting the prescribed requirements. . . ."

The regulation fostered research and development within the Army establishment. Since 1924, reviews, revisions, and changes of Army R&D policy and organization finally led to the recent review of R&D by the Roderick Board.

In 1927 AR 850-25 was revised and was given a broader perspective. This revised AR stated:

". . . preliminary research and development work will be conducted in many cases without a clear idea of what ends may be attained. . . ."

Additional revisions in 1931 and 1936 singled out the G4 Division of the General Staff as being charged with supervision of the Army-wide development program.

In 1940, the posture of American defense became subject to increased scrutiny, and in October a Development Section within G4 was formed —charged with the functions of AR 850-25 pertaining to development, tests, and standardization of equipment.

During the war years R&D received increased attention, with two significant events occuring near the close of World War II. On 15 May 1944, a Research and Development Division was established within the Army Service Forces; secondly, just prior to the end of the war in Europe, a milestone was reached in the Army's march toward R&D's present major status—the first official War Department Policy on Research and Development was issued. A policy clearly recognizing the importance of research and development.

MOBILE MISSILE CONTROL SYSTEM

A transistorized fire control system for guiding a lethal missile to its target, so lightweight that it can be worn on a waist belt, has been developed by Nord-Aviation.

The 11½ pound Waist Belt Fire Control was developed for use with Nord's SS-10 and SS-11 anti-tank missiles. This equipment replaces 76 pounds of control equipment formerly required for dependable missile firings against tanks, armored vehicles and pill boxes.

The major components of the Waist Belt Fire Control are (left to right in photo) as follows:

	Length	*Width*	*Depth*		
T 10 Electronic Generator	6" x	1½" x	6"	62 cu. inches	2 lbs. 4 oz.
Battery Pack	3½" x	1½" x	6"	37 cu. inches	1 lb. 2 oz.
Joystick Unit	— —	— x	6"	32 cu. inches	2 lbs.
Control Unit	4" x	3½" x	6"	84 cu. inches	1 lb. 9 oz.

The control unit contains a pre-fire integrated check-out through a system of small flashing lights on the face plate. The lights serve to confirm that the controls and the responses of the missile to signals will work properly once the missile is fired toward its target.

IRONS IN THE FIRE

Following World War II, Army Service Forces passed into history. Its R&D functions were transferred to the new Research and Development Division, War Department General Staff. In December 1947, R&D was placed under the Service, Supply and Procurement Division of the War Department General Staff. At this point R&D activity in the Army was practically moribund.

Then, the Communist threat of world domination, the explosion of science and technology, and the awareness of space progress led to a re-emergence of R&D as a vital factor when, on 10 October 1955, the present Office of the Chief of Research and Development was established—placing R&D on the Deputy Chief of Staff level.

* * *

The true significance of the most recent changes as they are promulgated by the present Chief of Research and Development, Lieutenant General Arthur G. Trudeau, will be reflected and tested by history, just as the past was.

However the stakes today are great indeed. Communism's challenge to the Free World—peace and freedom—places Army Research and Development in a most critical position. It must be unceasing in its effort to assure that the American soldier is armed with the most advanced and effective equipment that science and technology can conceive.

SIGNAL CORPS GUIDE

A guide book aimed at private industry that spells out major technical problem areas in the development of communications, electronic equipments and systems, has been published by Signal Corps as part of an Army program. There is both a confidential and an unclassified version of the guide.

Maj. Gen. R. T. Nelson, Chief Signal Officer, said the volume entitled "U. S. Army Research and Development Problems Guide, Signal Corps," will be distributed to qualified private organizations through the Commanding Officer, U. S. Army Signal Research and Development Laboratory, Fort Monmouth, New Jersey.

MISSILE TARGET

Flight test engineers check system of new Beechcraft PD 75-4-1 missile target preparatory to JATO launching from Beech zero-length launcher at White Sands Missile Range, N. M. Powered by a 145 hp Continental (TSIO-200) 4-cylinder, 4-cycle engine mounting a 58-inch Beech constant speed propeller, the new PD 75-4-1 is similar to the Navy and Army KDB-1 but is designed to provide greater performance at higher gross weight.

hot sparks

The Army's newest target missile—the Redhead-Roadrunner—is nearing fabrication stage at the Columbus Division of North American Aviation.

A Quartermaster Research Facility, designed specifically for use in connection with the Army's irradiated food program, will be constructed at the Quartermaster Research and Engineering Center, Natick, Massachusetts. The facility will be geared directly to the needs of a recently announced revised six-year, five-million-dollar Army program to accelerate research on specific irradiated foods for military use. The facility will include a megacurie Cobalt-60 source, a 24 MEV linear accelerator, and a supporting food preparation laboratory. The research facility will be built in lieu of a full-scale production plant, originally planned to be constructed at Stockton, Calif. Construction of the Stockton plant was suspended last October pending further laboratory studies to determine the feasibility of radiation as a practical means of food preservation. The Natick facility will assist in these studies.

A portable field anaesthesia plant for use by Army medical units under combat conditions is under development by the Army Engineer Research and Development Laboratories. The plant will enable the Army to minimize, if not eliminate, the necessity of shipping returnable cylinders of compressed gas to and from various theaters of operation.

A program to investigate and solve problems involved in the primary extraction of mapping detail from "side-looking" radar photography is being pursued by Arizona Division of Goodyear Aircraft Corp., under a contract awarded by the Army Engineer Research and Development Laboratories.

Ryan Firebee jet targets used by the U. S. Army will increase their capabilities by adding formation flying and electronic countermeasure (EMC) techniques as the result of a new contract for nearly $1 million. The contract extends for an additional year the Ryan flight service program to support the Army's missile research and development program at the White Sands Missile Range, N. M.

A development contract for five test-model radar sets weighing 35 pounds each has been awarded Airborne Instruments Laboratory, a Division of Cutler-Hammer, Inc. Cost is $235,000.

ARMY books

URGENT READING FOR TODAY

UNITED STATES ARMY IN WORLD WAR II. The Western Hemisphere: The Framework of Hemisphere Defense. Stetson Conn & Byron Fairchild. Office of Chief of Military History. 470 Pages; Maps; Index; $4.25.

Reviewed by

COL. FREDERICK BERNAYS WIENER, who, during the Second World War, worked on Caribbean plans and problems in the War Department, and was Staff JA, Trinidad Sector & Base Command.

In June 1940, France fell, and American planners turned to defense of the hemisphere on the assumption that Britain might not be able to hold out or, if she also fell, to save her fleet. This was the period of the early Rainbow plans. In the fall of 1940, when an emergency seizure of Vichy-held Martinique was being considered, the Army's best-trained division, the 1st Infantry, could provide but a single task force of 5,000 able to mount a contested assault. The next summer, at about the time Hitler attacked the Soviet Union, the U. S. Army's offensive combat strength was still close to zero: what with legislative restrictions and training obligations, it could not dispatch even a modest expeditionary force without denuding American defenses. Indeed, the hemisphere was not really safe until after the initial landings in North Africa in November 1942.

Reading the story of the crises of 20 years ago necessarily prompts inquiries of current immediacy. How much better are we prepared to defend the hemisphere today, with a virtually Communist Cuba at our doorstep, a Panama in which important elements seek to emulate Nasser's Suez Canal seizure, strong strata of anti-Americanism throughout South America, and, most threatening of all, Khrushchev's declaration that the Monroe Doctrine is obsolete? What is our *real* offensive strength today, two years after Lebanon? Are bases—specifically, our bases in what is now the West Indian Federation—obsolete in view of current Caribbean trouble spots?

This book is therefore of intense interest at this time, and its narrative should provoke considerable self-searching. It deals with the basic policies of hemisphere defense, and covers our relations with the principal American powers that were associated with us before and during World War II: Brazil, Mexico, Canada. The actual manning of the several bases will be treated in another volume.

In every Latin-American country, national pride and insistence on every perquisite of sovereignty were major factors. Pan American Airways could come in to operate essentially military airports, our Air Corps personnel might be admitted in civilian clothes and without arms. But our combat troops were a different matter. And, even when token detachments were permitted to enter, as in the case of the CAC units in Venezuela, the Latins still insisted that the U. S. flag fly from a staff shorter than that which bore the flag of the host nation. (Such a provision was actually embodied in the formal agreement.)

Mexico was most cooperative, provided a string of airfields, early declared war on the Axis, and eventually supplied a fighter squadron that saw service in Luzon. But please, no U. S. troops; the memories of 1846 and of 1914 still rankled.

Brazil was similarly cooperative, and in time became the first Latin-American nation to send troops overseas; it had a division in Italy with General Mark Clark's Fifth Army. But the Brazilians long and, ultimately with success, resisted every U. S. effort to station ground troops in the Brazilian bulge. Brazil wanted modern weapons, which at first we could not supply even in token quantities; and some old coast defense guns that we did send lacked ammunition and even drawings for ammunition. These were factors that hardened Brazil's insistence on defending herself. Actually, one of the greatest contributions made by the Brazilians were the airfields; in the words of the authors, "The airway to Brazil, planned for hemisphere defense, became in 1943 the air funnel to the battlefields of the world."

This book, then, is contemporary reading of the most urgent kind. It suggests, too, the value of an incisive, perceptive personality able to formulate and force decisions. The hero of this volume, whose vision, sagacity, and politico-strategic insight shine through page after page of the narrative, is the officer who then was the War Plans Division's Latin-American expert: Colonel Matthew B. Ridgway.

FALL OF SINGAPORE

FORTRESS: The Story of the Siege and Fall of Singapore. Kenneth Attiwill. Doubleday & Company. 243 Pages; Illustrated; Maps; Index; $4.50.

Reviewed by

RILEY SUNDERLAND, who helped write the Army's official history of the CBI Theater.

Kenneth Attiwill, an Australian captured by the Japanese at Singapore, who went on after the war to publish eight books and two plays (and only those who spent the war in Japanese prison camps can really appreciate the courage and vitality such a recovery shows) has assembled a number of quotations plus a bit of narrative into a book he calls the story of the siege and fall of Singapore. What Attiwill has written shows the touch of a skilled professional, but it is the lesser part by far. What he has done is to compile a great number of quotations from the British official history, from memoirs, from despatches, and from interviews, strung them on a thread of chronology with here and there a comment or a criticism, and offered this as the story of the fall of Singapore.

In all this Mr. Attiwill is completely straightforward, and seems to think this is the way to write history. His voluminous quotations are carefully identified, and as they go on for page after page the reader is in no doubt as to who is speaking to him. It is seldom Mr. Attiwill. Surely there is more to research than quoting other people's works!

This is not to say the book lacks interest, for Mr. Attiwill has chosen his quotations with care. Some good writing has been done on Singapore, whether by Sir Winston Churchill, newspaper correspondents, or the official historians, and to have this assembled in one book is convenient.

The most interesting parts of *Fortress* are the interviews which, faithful to his method, Mr. Attiwill quotes verbatim and at length. Signalman Fred Mutton and Colonel John Dalley have vivid stories to tell; Mr. Attiwill might perhaps think of collaborating with them. For the rest, anyone interested in an authoritative account of the campaign will find that the story is told with complete candor and in accord with the professional standards of both the soldier and the historian by the Cabinet Office Historical Section in the British official history.

UNIQUE BATTLE EXPERIENCES

THEN A SOLDIER. Brig. Gen. A. B. Beauman, CBE, DSO. P. R. Macmillan, Ltd. 186 Pages; Maps; 12/6.

Reviewed by

COL. H. D. KEHM, who served at SHAEF and Ninth Army and later was Army Attaché in Ireland.

The author of this well-written little book says that while there have been many war books by men who were at or near the top and by "angry or not-so-angry young men who served either in the ranks or as junior officers," there is almost a complete lack of literature by the middle strata, "those who, though moderately successful, never rose to high command." He classifies himself in this group. From there, he says, there is a view at both worlds.

The description of World War I fighting (Beauman was a brigadier at 29) will appeal to those interested in small-unit actions. His comments on life in the peacetime Army delightfully describe the interests and reactions of a typical sports-minded officer keen on riding, hunting (on a horse), fishing, and shooting (hunting with a gun).

The story of his service during 1940, as Viscount Alanbrooke says in the foreword, is both unique and remunerative. Some of the ways devised to meet the problems that arose after the German armor broke through will be thought-provoking for those concerned with the refinement of doctrines to meet the "no front" conditions visualized as typical in a future war.

The author's comments sometimes display the characteristics he ascribes to "angry young men." The War Office, Lord Gort, General Ironside, and various commanders and staff officers come in for considerable criticism in charges of stupidity, lack of imagination, and lethargy. An example: "The War Office are always at their best when they have unlimited time to make their plans. The scheme for the passage of the B.E.F. to France . . . was . . . a first rate example of carefully planned staff work. . . . When less deliberate action proved necessary, the cumbersome methods of the War Office proved a serious handicap."

The author is a staunch admirer of Alanbrooke and of Montgomery. Many of his views and comments are similar to Monty's. Therefore, though they are entertainingly and vigorously expressed, goodly parts of them must be taken with some salt of skepticism.

BEST GUIDE TO SHOOTING

THE ADVANCED PISTOL MARKMANSHIP COACHES GUIDE. U. S. Army Advanced Markmanship Unit. 29 Pages; Illustrated.

Reviewed by

LT. COL. SIDNEY C. CARPENTER, Assistant Executive Officer, National Board for the Promotion of Rifle Practice, and coach of the 1960 Olympics shooting team.

This manual, compiled by the Army's Advanced Marksmanship Unit at Fort Benning, is by far the best guide to good pistol shooting ever published. It covers such important shooting techniques as fundamentals of pistol marksmanship; zeroing and preliminary preparation; application of fundamentals; shot analysis and posture corrections; duties of the coach; mental discipline; attributes of a team shooter; helpful tips; safety; detrimental effects of alcohol and smoking; and physical conditioning.

This is an informative manual, well written in popular language by the top marksmanship officials and shooters of the U. S. Army. It enjoins the shooter to think "performance" rather than "score." It stresses the importance of physical conditioning, how to cope with match pressure, psychological distractions, and a multitude of other problems which confront the shooter on the firing line.

In general, the manual outlines most of the tried and proved fundamentals of shooting of which all outstanding shooters are well aware, but which few of them apply at times.

This guide is particularly significant since some of the techniques it outlines are of a controversial nature, with emphasis on the concepts of marksmanship as it is being taught today. Each of these concepts, however, has been thoroughly analyzed and discussed with the best competitive pistol shooters in the world today, who unanimously agree with these concepts as written.

Every pistol shooter, experienced or not, should read this very interesting and informative work. After examining it thoroughly, I firmly believe that whether you wish to teach the "best" methods of pistol training, whether you just want to "shoot," or whether you aspire to become top man in the field of competitive pistol shooting, this guide can well lead you to your goal.

DECISIONS AT POTSDAM

BETWEEN WAR AND PEACE: THE POTSDAM CONFERENCE. Herbert Feis. Princeton University Press. 367 Pages; Index; $6.50.

Reviewed by

FORREST C. POGUE, military historian, and co-author of *The Meaning of Yalta.*

The Allies came to Potsdam in the closing days of the war aware that they were about to complete the ruin of the Axis Powers. It was

a moment of triumph and, as Mr. Feis says, "should have been a time of exultation." Instead, the deliberations were marked by doubt and distrust. Churchill, usually an ebullient spirit, was cast down by his fears of Russian expansion no less than by the opposition at home which in the course of the meeting was to bring his downfall as head of the British government. In the best summary yet to appear of the decisions relating to European problems at the Terminal Conference in July 1945, Mr. Feis shows why the Allies in a moment of victory feared for the future.

Unpublished papers of the State Department and private documents of Ambassador Grew, Senator Byrnes and Governor Harriman provide new material to piece out the published accounts of Churchill, President Truman, Admiral Leahy, and Secretary Stimson. Mr. Feis, in this volume, as in his previous books on Pearl Harbor, China policy, and World War II strategy prior to Potsdam, skillfully draws his material together without trying to impose conclusions.

More than a third of the book is devoted to the period between VE-day and the beginning of the Potsdam Conference. It is a period filled with irritating disputes, such as that between the U. S. and France over French activities on the northwestern Italian frontier, and between Tito and the Allies over Venezia Giulia. The Russians caused trouble over voting procedure in the UN charter and blustered enough about other matters to bring from Churchill a proposal that we go slow about withdrawing to our proper zones of occupation in western Germany. The U. S., eager to redeploy part of its troops to the Pacific and opposed to staying in Europe any longer than could be helped, pressed for a speedy evacuation of German territory marked for Russian occupation.

The vexing problem of access to Berlin is reviewed in detail, and Mr. Feis cites memoranda by President Truman and the JCS in which they left arrangement of these matters to military commanders on the spot. From State Department records, we find that Gen. Lucius Clay, Gen. Sir Ronald Weeks, and Marshal Zhukov at the end of June agreed to the use of a single railroad and a single roadway, in addition to the airlanes, into Berlin. The Allies understood that the ground approaches would be free of border search or control by the Russians. However, it appears that these understandings were never written down in any official agreement. A desire not to make rigid these limited concessions on access and a wish to avoid the delays which a more formal agreement would require apparently influenced the decision.

Since Mr. Feis has left to another volume all important discussions of Far East questions, the important chapters on the Potsdam meeting center around Poland, German boundaries and reparations, and Austria. In all the discussions the intent of the Russians was made evident and the Allies seemed to hope to do no more than extract a few doubtful promises and urge a degree of moderation.

On the very eve of the conference a new force entered upon the international scene with the successful testing of the atomic bomb. Mr. Churchill thought he detected in Mr. Truman's approach to Marshal Stalin a firmness based on the knowledge of America's possession of this new weapon. But Mr. Feis finds no evidence that it strengthened our opposition to Russian demands or lessened our wish to have Soviet aid against Japan.

Feis indicates that General Marshall gave Secretary Stimson the impression that with our possession of the atomic bomb, we no longer needed Russian aid to conquer Japan. But he did believe that their help would bring the end more quickly and with smaller loss of life. Many U. S. leaders believed that the Russians could take much of what they claimed in Europe and in the Far East. Perhaps more important than anything else in deciding the nature of our approach to the Russians at Potsdam was the conviction that our efforts should be directed towards strengthening collaboration between the Western Allies and the Soviet Union for the building of a lasting peace.

THE SUPERB AND THE GALLANT

HANCOCK THE SUPERB. Glenn Tucker. Bobbs-Merrill Company. 368 Pages; Illustrated; Maps; Index; $5.00.

COLONEL JOHN PELHAM: LEE'S BOY ARTILLERIST. William Woods Hassler. Garrett & Massie. 185 Pages; Illustrated; Maps; Index; $3.50.

Reviewed by

LT. COL. FAIRFAX DOWNEY, author of *Sound of the Guns, The Guns at Gettysburg, Clash of Cavalry,* and *Famous Horses of the Civil War.*

The equestrian statue of General Winfield Scott Hancock in Washington often confronted me as a boy. A fine figure of a soldier, I thought, an Army brat with an eye for such. So Hancock was in life, and his career matched his appearance.

Hancock's father, who had served in 1812 under Winfield Scott, named one of his twin boys for his old commander, who came to be proud of his namesake's record at West Point and in Mexico. That pride would have extended to Hancock's Civil War service had Old Fuss and Feathers lived long enough to voice it.

An outstanding officer, Hancock. Well up to corps command and perhaps higher where he might have risen if his severe wound at Gettysburg had not invalided him for a critical six months. While he never led an army (his Democratic politics are mentioned as a stumbling-block), neither did others better qualified than some who held that post. Reynolds, killed at Gettysburg, had refused command of the Army of the Potomac. Longstreet, but for Jefferson Davis's fixation on Braxton Bragg, might well have achieved a far happier outcome for the South in the Chattanooga campaign. But it was not in Hancock's stars. The fortunes of war never carried him quite far enough. Neither did those of peace. During Reconstruction he served ably as military governor of Louisiana and Texas but fell out with Grant and was shifted and shelved. In 1880 he ran for the Presidency on the Democratic ticket and barely missed election.

Gettysburg can be considered Hancock's big battle. At The Angle his II Corps was the barrier that bent but did not break. In the course of the Confederate bombardment preceding the charge, Hancock countermanded an order of General Hunt, Chief of Artillery, for the Union guns to hold their fire. Resume firing, was Hancock's

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command, and the guns were under his corps control. As a result, most of the shell and shrapnel was expended before the Gray ranks came within effective range, and only canister remained. Mr. Tucker subscribes to a defense of Hancock's action: that reply fire was needed to preserve the morale of the Federal infantry. But most of the enemy shelling, overshot, was falling on rear areas. Hunt contended that the long-range ammunition, withheld until the proper moment, would have wrecked the charge before it reached the Union lines. It achieved that on other parts of the front. However, Hancock's conduct of the defense, except for that one error of judgment, as it seems to some students of the battle, merits the adjective "superb."

This book is well researched and written, as was to be expected of the author of *Poltroons and Patriots* (War of 1812) and *High Tide at Gettysburg*. It fills a biographical gap; two earlier lives of Hancock were productions for his Presidential campaign.

Pelham, the gallant Confederate artilleryman—St. Barbara never owned a more worthy devotee—has also been the subject of three biographies. Preceding the current one by Mr. Hassler, also author of a life of General A. P. Hill, was Philip Mercer's *The Life of the Gallant Pelham* (1929). It is of the life-and-letters type but valuable for its reprint of many of Pelham's West Point letters. In 1959 appeared Charles G. Milham's *Gallant Pelham: American Extraordinary*. It is by far the best of the trio.

Hard on its heels, the Hassler works suffers by comparison with the Milham biography. Here is a young man writing with enthusiasm and sympathy about another young man, killed in action at the age of 24, but the writing is immature. There are a number of instances of unfortunate misuse of military terminology. For example, the "Colonel" in the title is incorrect. Pelham was a lieutenant colonel by posthumous promotion; had he lived, he would of course have been addressed as "Colonel" only orally. Again, Sam Sweeney, the banjo player, is referred to as Jeb Stuart's "aide." No aide de camp, Sweeney was a trooper detailed to Stuart's headquarters staff.

On the credit side are illustrations by Sidney E. King and a commendable appendix on the materiel and service of Civil War artillery.

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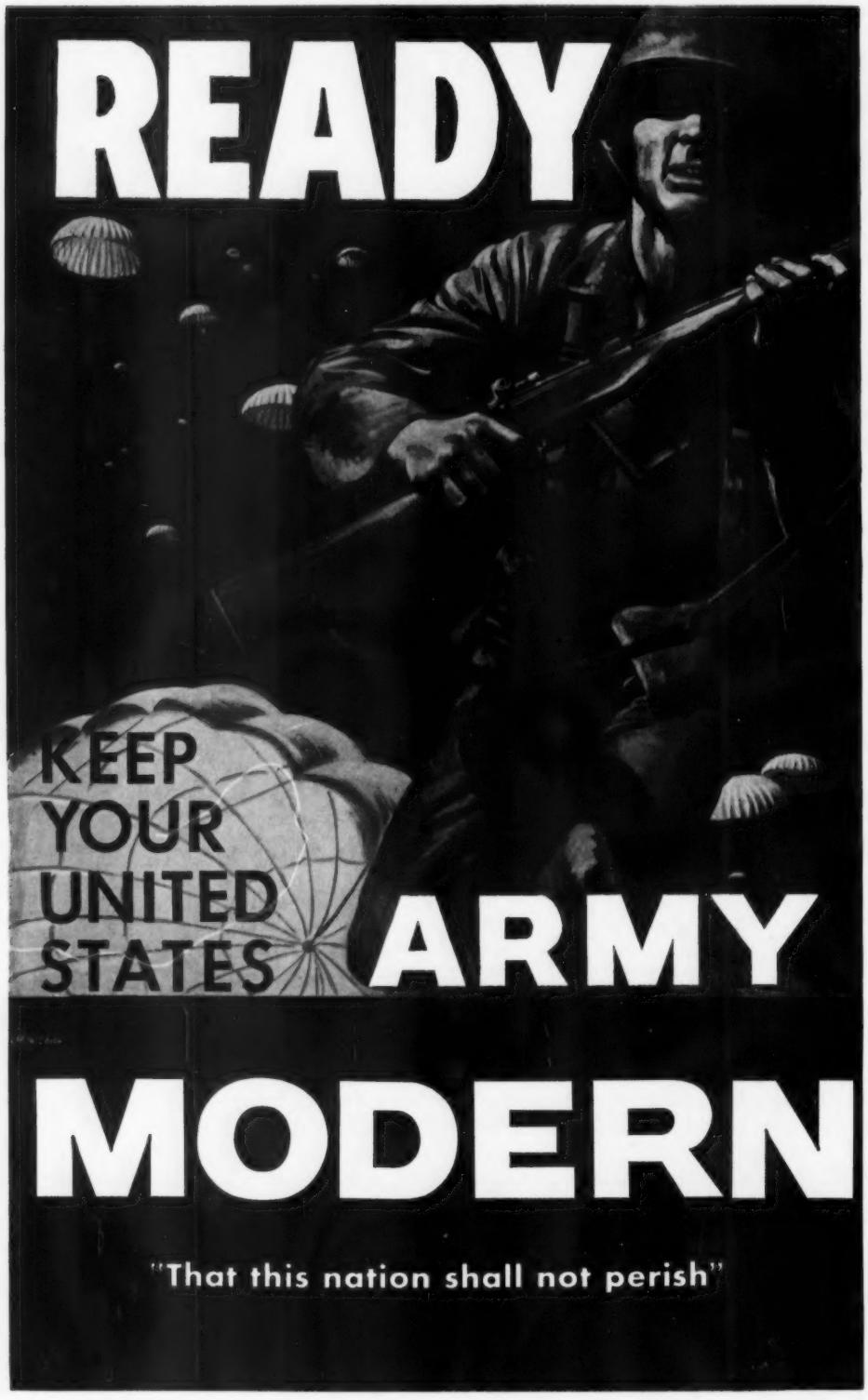
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